Today's Challenge = Complete the table by writing each expression using exponents, then compute the value of the expression.

<table>
<thead>
<tr>
<th>Expression</th>
<th>Using Exponents</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. $2 \times 3 \times 5 \times 7$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. $3 \times 3 \times 3$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. $2 \times 2 \times 7 \times 7$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. $2 \times 5 \times 5 \times 5$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. $3 \times 5 \times 5$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. $2 \times 2 \times 2 \times 5$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. $2 \times 5 \times 5 \times 7$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. $2 \times 2 \times 2 \times 7$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. $3 \times 3 \times 7$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. $2 \times 3 \times 3 \times 3$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Go Further = Find factors for the numbers. If your factors are not prime numbers, find the prime factors. Write your final answer using exponents.

Example:

$72 = 9 \times 8$

$9 = 3 \times 3$

$8 = 2 \times 4 = 2 \times 2 \times 2$

So, $72 = 3 \times 3 \times 2 \times 2 \times 2$

$= 3^3 \times 2^3$

11. Factor 96. ____________________

12. Factor 147. ____________________

13. Factor 300. ____________________

On today's activity: (Circle one)  I need to know more.  I got it.
Today’s Challenge  Fair Games

Work with a partner to play the *Number Cube Difference* game.

- If your last name is first in alphabetical order, you are Player B.
- Player A and Player B each roll a number cube.
- If the difference between the numbers that land face up is zero, one, or two, Player A wins. If that difference is three, four, or five, Player B wins.

1. Play the game 50 times and keep track of who wins each game in this table.

<table>
<thead>
<tr>
<th>Tally Marks for Wins</th>
<th>Total Number of Wins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Player A Wins</td>
<td></td>
</tr>
<tr>
<td>(Difference 0, 1, or 2)</td>
<td></td>
</tr>
<tr>
<td>Player B Wins</td>
<td></td>
</tr>
<tr>
<td>(Difference 3, 4, or 5)</td>
<td></td>
</tr>
</tbody>
</table>

2. Get the final results from three other pairs of players. Record the data in this table.

<table>
<thead>
<tr>
<th>Our Results</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Player A Wins</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Player B Wins</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. If you wanted to win this game, would you rather be Player A or Player B? Explain.

   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________

On today’s activity: (Circle one) ☐ I need to know more. ☑ I got it.

Name ___________________________ Date ___________
Go Further  Fair Games

Last time, you found that the Number Cube Difference game was not a fair game. Player A was more likely to win than Player B was. A game between two players is fair if they have an equal chance of winning.

1. Fill in this table with the absolute values of differences between possible values on two face-up number cubes.

   Absolute Values of Differences  
   
<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Work with a partner. Study your table and write about anything you notice that might explain the unfairness of the game.

Things we discovered:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

2. Your table is a sample space for your game because it shows all possible outcomes of a two-cube toss. What is the probability of rolling each difference? Do not simplify your fractions.

   A. 0 _______  B. 1 _______  C. 2 _______
   D. 3 _______  E. 4 _______  F. 5 _______

3. How could you change the game so that Player A and Player B have an equal chance of winning the game?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

On today’s activity: (Circle one)  I need to know more.  I got it.

Name ______________________ Date __________
### Get Started

**Example 1**

| Area: 12 square meters | ![Triangle](h=__, b=6 m) |

**Example 2**

| Area: 12 square meters | ![Triangle](h=__, b=8 m) |

### Today's Challenge

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Area: 12 square feet</td>
<td>![Triangle](h=__, b=12 ft)</td>
</tr>
<tr>
<td>2.</td>
<td>Area: 12 square feet</td>
<td>![Triangle](h=__, b=4 ft)</td>
</tr>
<tr>
<td>3.</td>
<td>Area: 12 square centimeters</td>
<td>![Triangle](h=__, b=3 cm)</td>
</tr>
<tr>
<td>4.</td>
<td>Area: 12 square centimeters</td>
<td>![Triangle](h=4 cm, b=__)</td>
</tr>
<tr>
<td>5.</td>
<td>Area: 6 square yards</td>
<td>![Triangle](h=3 yd, b=__)</td>
</tr>
<tr>
<td>6.</td>
<td>Area: 6 square yards</td>
<td>![Triangle](h=__, b=6 yd)</td>
</tr>
<tr>
<td>7.</td>
<td>Area: 6 square inches</td>
<td>![Triangle](h=6 in, b=__)</td>
</tr>
<tr>
<td>8.</td>
<td>Area: 6 square inches</td>
<td>![Triangle](h=__, b=12 in)</td>
</tr>
<tr>
<td>9.</td>
<td>Area: 10 square yards</td>
<td>![Triangle](h=__, b=4 yd)</td>
</tr>
<tr>
<td>10.</td>
<td>Area: 10 square yards</td>
<td>![Triangle](h=2 yd, b=__)</td>
</tr>
<tr>
<td>11.</td>
<td>Area: 20 square feet</td>
<td>![Triangle](h=__, b=5 ft)</td>
</tr>
<tr>
<td>12.</td>
<td>Area: 20 square feet</td>
<td>![Triangle](h=4 ft, b=__)</td>
</tr>
</tbody>
</table>

**On today's activity:** (Circle one) ☐ I need to know more. ☐ I got it.
Get Started  Circle the letter of the correct answer. Which equation could be used to solve this problem? Explain why you did or did not choose each equation.

Miguel has a lawn mowing business. He charges a minimum fee of $12.00 for any lawn mowed, plus $9.00 per hour. How much will it cost (c) in dollars to mow a lawn if it takes h hours to mow it?

A.  $c = 1200 + 9h$  
B.  $c = 12 + 9h$

C.  $c = 1200 + 900h$  
D.  $c = (12 + 9)h$

Today's Challenge  Circle the letter corresponding to the equation that could be used to solve these problems.

1. A store is having a 30% off sale on in-line skates. If a pair of in-line skates regularly costs $62.00, what is the sale price (s)?
   A.  $s = 0.3(62)$  
   B.  $s = 30(62)$  
   C.  $s = 0.7(62)$  
   D.  $s = 1.3(62)$

2. Stephanie's long distance phone company has a $6.00 monthly fee with an additional charge of four cents per minute. If Stephanie uses this service for m minutes in a month, which of these formulas could be used to find her cost in dollars (c) for long distance phone service?
   A.  $c = 6 + 0.04m$  
   B.  $c = 6.04m$  
   C.  $c = 6(0.04)m$  
   D.  $c = 600 + 0.04m$

3. Beth measured her mattress so that she could buy a new one. She found it to be one yard, two feet, eight inches long. When she went to the store, she found all the mattresses marked in inches. How long (ℓ) is Beth's mattress in inches?
   A.  $ℓ = 3(12) + 2(12) + 8$  
   B.  $ℓ = 3(12) + 2(12) + 8$
   C.  $ℓ = 3(36) + 2(12) + 8$  
   D.  $ℓ = (3 + 2)36 + 8$

4. Kim gets a weekly allowance of $8.00 plus an extra 50 cents for every chore he does. If Kim received $12.50 this week, how many chores (c) did he do?
   A.  $12.50 = 8.00 + 50c$  
   B.  $12.50 = 8.00 + 0.5c$  
   C.  $12.50 = 8.00c$  
   D.  $1250 = 8.00 + 50c$

5. What advice would you give to a student writing and analyzing equations involving money?

On today's activity: (Circle one)  I need to know more.  I got it.
Today’s Challenge: Organize these terms by putting them into the correct categories.

1. These are words that are related to equations and expressions.
   ____________________________ ____________________________
   ____________________________ ____________________________

2. These are words that are related to sets of numbers.
   ____________________________ ____________________________
   ____________________________ ____________________________

3. These are words that are related to algebraic properties.
   ____________________________ ____________________________
   ____________________________ ____________________________

4. These are words that state a relationship between numbers.
   ____________________________ ____________________________
   ____________________________ ____________________________

Go Further

5. List five other mathematical terms that you know. Give an example for each term.
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

On today’s activity: (Circle one)  I need to know more.  I got it.
Today's Challenge: Geometric Patterns

Study the six figures in this pattern. Each is made from equilateral triangles and rhombi. Notice that the triangle in the figures has two orientations, one pointing up and one pointing down. The rhombus also has two orientations, one leaning left and one leaning right.

\begin{align*}
n = 1 & \quad \begin{array}{|c|}
\hline \\
\end{array} \\

n = 2 & \quad \begin{array}{|c|c|c|}
\hline & & \\
\hline & & \\
\hline & & \\
\hline
\end{array} \\

n = 3 & \quad \begin{array}{|c|c|c|}
\hline & & \\
\hline & & \\
\hline & & \\
\hline
\end{array} \\

n = 4 & \quad \begin{array}{|c|c|c|c|}
\hline & & & \\
\hline & & & \\
\hline & & & \\
\hline
\end{array} \\

n = 5 & \quad \begin{array}{|c|c|c|c|c|}
\hline & & & & \\
\hline & & & & \\
\hline & & & & \\
\hline
\end{array} \\

n = 6 & \quad \begin{array}{|c|c|c|c|c|c|}
\hline & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{array}
\end{align*}

1. On a sheet of isometric dot paper, draw the figures for $n = 7$–$12$.

2. Is this pattern an ABABABAB pattern or an ABCDABCDABCD pattern? Explain your reasoning.

---

On today's activity: (Circle one) I need to know more. I got it.

Name ___________________________ Date ___________
Go Further  Geometric Patterns

Work with a partner. Study your drawings for page 7. Look in particular for ways to tell what the last polygon in the figure will be. Write any interesting facts or patterns you see.

Things we discovered: ____________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

1. What are the shape and orientation of the polygon that is at the end of each of these figures?
   A. \( n = 15 \)
   B. \( n = 20 \)
   C. \( n = 21 \)
   D. \( n = 18 \)

2. Explain how to find the last polygon for any value of \( n \).
   _____________________________________________________________________________

3. Can you tack the figure for \( n = 4 \) to itself to get the figure for \( n = 8 \)? Explain.
   _____________________________________________________________________________

4. Can you tack the figure for \( n = 5 \) to itself to get the figure for \( n = 10 \)? Explain.
   _____________________________________________________________________________

5. Can you tack the figure for \( n = 6 \) to the figure for \( n = 4 \) to get the figure for \( n = 10 \)? Explain.
   _____________________________________________________________________________

On today's activity: (Circle one) \( \square \) I need to know more. \( \square \) I got it.

Name ___________________________ Date ____________
Today's Challenge — Find numbers between 101 and 999 that are divisible by the given number. Record the numbers in the space provided.

1. Numbers divisible by two:
   
   

2. Numbers divisible by three:
   
   

3. Numbers divisible by six:
   
   

4. Numbers divisible by nine:
   
   

5. Numbers divisible by three but not divisible by six:
   

6. Numbers divisible by two but not divisible by six:
   

Go Further — Create your own Math Jumble. Create a jumble that includes possible answers to these questions. Ask a friend to answer the questions.

7. Numbers divisible by two OR three but not both:
   

8. Numbers divisible by nine but not divisible by two:
   

9. Numbers divisible by six but not divisible by nine:
   

Friend’s name ________________________________

On today's activity: (Circle one)  I need to know more.  I got it.

Name ___________________________  Date ________
Get Started  Mark the letter of the grid or grids with the correct answer. Explain what is wrong with the incorrectly marked grids.

The price in a grocery store went from $1.29 to $1.47. What was the percent of increase in the price? Round your answer to the nearest percent and write it in an equivalent form that the scoring machine will understand.

Today's Challenge  Record your answers on the appropriate gridded response form. Set up a proportion and solve these problems. Round to the nearest tenth and write as a decimal.

1. In softball this year, Mary Jo had 12 hits in 28 at bats. What percent of her at-bats resulted in hits?

2. Tickets for the football game are increasing from $59.00 to $73.00. What is the percent of increase in the ticket price?

3. Last year the Nash School of Mathematics had 783 students. This year their enrollment increased to 856 students. What was the percent of increase in enrollment?

4. The cost of a mountain bike increased by $34.00 from last year's price of $458.00. What was the percent of increase in the price?

5. What advice would you give to a student writing percents into gridded response forms?

On today's activity: (Circle one)  I need to know more.  I got it.

Name

Date
Today's Challenge  Use the numbers from the box to answer the questions. You will not use all of the numbers.

1. The number of feet in one mile? _________

2. The number of months in 2.5 years? _________

3. The number of millimeters in 2.5 centimeters? _________

4. The number of inches in $1\frac{1}{4}$ yards? _________

5. The number of hours in $1\frac{3}{4}$ days? _________

6. The number of feet in $5\frac{1}{3}$ yards? _________

7. The number of ounces in 1.5 pounds? _________

8. The temperature, in degrees Celsius, at which water freezes? _________

9. The number of centimeters in 25 meters? _________

10. The number of quarts in 2.5 gallons? _________

Go Further  Write what you think.

11. If you saw the number 12 you might think it was eggs in a dozen, numbers on a clock, inches in a foot, or months in a year. Tell what the numbers 10 and 24 make you think of.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

On today's activity: (Circle one)  I need to know more.  I got it.
Today's Challenge: Pattern Perimeter and Area

Figure 1 \((n = 1)\) contains one element, a triangle pointing up.
Figure 2 \((n = 2)\) contains two elements, a triangle pointing up and a rhombus leaning left. This is Figure 4.

After \(n = 4\), the pattern repeats.

\[
\begin{array}{c}
\text{n = 5} \\
\text{n = 6} \\
\text{n = 7} \\
\text{n = 8}
\end{array}
\]

1. If the length of a side is one unit, find the perimeters of the first 10 figures and record them in this table. If you need to, draw the diagrams or refer to your work on student page 7.

<table>
<thead>
<tr>
<th>Figure Number</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perimeter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(in units)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. If the area of the triangle is one triangular unit and the area of the rhombus is two triangular units, find the areas of the first ten figures in the pattern and record them in this table.

<table>
<thead>
<tr>
<th>Figure Number</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>(in triangular units)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On today's activity: (Circle one)  I need to know more.  I got it.
Go Further  Pattern Perimeter and Area

Work with a partner and look for patterns in the tables you completed for page 12. Hint: look at odd-numbered figures as a group, then look at even-numbered figures as a group.

Things we discovered: 

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

1. How many triangles will be in Figures 26 and 43? Explain your reasoning.

________________________________________________________________________

________________________________________________________________________

2. How many rhombi will be in Figures 26 and 43? Explain your reasoning.

________________________________________________________________________

________________________________________________________________________

3. Predict the perimeters of Figures 26 and 43. Explain your reasoning.

________________________________________________________________________

________________________________________________________________________

4. Predict the areas of Figures 26 and 43. Explain your reasoning.

________________________________________________________________________

________________________________________________________________________

On today’s activity: (Circle one)  I need to know more.  I got it.

Name  

Date  

(Circle one)  I need to know more.  I got it.
Go Further  Follow the directions to mark numbers in the grid. Some will be marked more than once.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>36</td>
<td>6</td>
<td>45</td>
</tr>
<tr>
<td>64</td>
<td>44</td>
<td>32</td>
<td>9</td>
</tr>
<tr>
<td>48</td>
<td>72</td>
<td>66</td>
<td>12</td>
</tr>
<tr>
<td>54</td>
<td>84</td>
<td>20</td>
<td>60</td>
</tr>
</tbody>
</table>

1. Cross out all numbers that are divisible by five.
2. Circle all numbers less than or equal to $2^3 + 3^2$.
3. Star all numbers that are multiples of 11.
4. Underline all numbers that are multiples of both three and four.
5. Box all numbers greater than the number of ounces in three pounds.
6. Which number is not marked? _______
7. Write at least three statements to describe that number.

On today’s activity: (Circle one) □ I need to know more. □ I got it.
Get Started  Fill in the letters of analogies that make sense. Explain what is wrong with the incorrect analogies.

A  Apple is to pie as chocolate chip is to cookie. __________________________

B  Square is to cube as circle is to cone. __________________________

C  c is to d as h is to g. __________________________

D  □ is to □ as □ is to □ __________________________

Today's Challenge  Provide a word or diagram that completes the analogy.

1. Cone is to cylinder as __________ is to prism.

2. □ is to □ as □ is to __________

3. □ is to □ as □ is to □

4. □ is to □ as □ is to □

5. Use these figures any way you like to create two different analogies. You may reuse any figure and you do not need to use them all. You may also use shading, rotations, or reflections.

   □ □ □ □ □

6. What advice would you give to a student about solving spatial analogies?

   __________________________

On today's activity: (Circle one)  I need to know more.  I got it.

Name  __________________________

Date  __________________________
Today's Challenge  Translate each sentence into an equation. Solve the equation.

1. Taking 16 away from my number, \( n \), leaves 18. ________

2. Nine times my number, \( n \), equals 108. ________

3. Four times my number is 144. ________

4. Adding 32 to my number is 58. ________

5. One third of my number is 21. ________

6. The square of my number is 64. ________

7. 35 less than my number is 40. ________

8. My number increased by 27 is 42. ________

9. One fourth of my number is 13. ________

10. The square of my number is 144. ________

Go Further

11. Write a word equation with a solution less than 50. Ask a friend to translate it into a math equation and solve it. If you disagree on the solution, edit your work.

________

________

________

Friend’s name ____________________________

On today's activity: (Circle one) I need to know more. I got it.
Today's Challenge: Diagonals on a Grid

Draw the diagonal that goes from the upper right hand corner to the lower left-hand corner of each rectangle. Then count the number of small squares that are intersected by the diagonal. Record that information in the table.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th></th>
<th>B</th>
<th></th>
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</thead>
<tbody>
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<td>1.</td>
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<table>
<thead>
<tr>
<th></th>
<th>Squares Intersected by Diagonal</th>
<th></th>
<th>Squares Intersected by Diagonal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rectangle</td>
<td></td>
<td>Rectangle</td>
</tr>
</tbody>
</table>

On today's activity: (Circle one)  
- I need to know more.  
- I got it.

Name ___________________________ Date ____________
Go Further  Diagonals on a Grid

Last time, you collected information about the number of squares intersected by diagonals drawn on various shaped rectangles. The A rectangles are different from the B rectangles. Work with a partner to discover how they are different.

Things we discovered:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

1. Write a rule or formula for finding the number of grid-squares intersected by diagonals of a rectangle.

________________________________________________________________________

2. How many grid-squares will be intersected by a diagonal drawn in a 7 × 11 rectangle? _________

3. How many grid-squares will be intersected by a diagonal drawn in a 6 × 10 rectangle? _________

4. A lattice point is where the grid lines inside your rectangles intersect. Can you predict for which rectangles the diagonal will pass through at least one lattice point? Explain.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

On today’s activity: (Circle one)  I need to know more.  I got it.
Get Started

1. \[2\frac{3}{4} \text{ in.}\]

2. 

Perimeter = ________

Perimeter = 8.24 cm

Go Further

3. Solve this riddle.
   
   **Clues:**
   - I am an isosceles trapezoid.
   - I have a perimeter equal to 6.3² inches.
   - The sum of the lengths of my non-parallel sides is the greatest common factor of 75 and 105.
   - I have a long base that is twice the length of my short base.
   - What are the lengths of my sides? _______________ inches.

4. Fill in the blanks to make a Perimeter Riddle. Include some lengths that are not whole numbers.
   
   **Clues:**
   - I am a ________________.
   - I have perimeter equal to ________________.
   - I have ________________ whose lengths are ________________.
   - I have ________________ whose lengths are ________________.
   - What are the lengths of my sides? ________________

5. Now write your own riddle for a friend to solve.
   
   **Clues:**
   
   ____________________________
   ____________________________
   ____________________________
   ____________________________

   What are the lengths of my sides? ________________

   Friend’s name ____________________________

**On today’s activity:** (Circle one) ★ I need to know more. ★ I got it.

Name ____________________________
Date ____________________________
Get Started ➤ Use the diagram to solve the problem.

Your basketball team is raising funds by selling boxes of candy. You were given some boxes of candy and your parents bought three of them. You then sold two boxes each to your four aunts. Your math teacher then bought half of the remaining boxes. You were able to sell the last two boxes to your neighbor. How many boxes of candy did you start with?

Today's Challenge ➤ Use the diagram and work backward to solve each problem.

1. According to The World Almanac and Book of Facts 2001, the cheetah is the fastest animal on the planet. A lion is \( \frac{5}{7} \) as fast as a cheetah and a greyhound is 10.65 mph slower than a lion. A reindeer is 7.35 mph slower than a greyhound and the elephant is \( \frac{25}{32} \) as fast as a reindeer. If you multiply the speed of an elephant by \( \frac{2}{3} \) and add one, you get the speed of a pig, which is about 11 miles per hour. How fast does a cheetah run?

2. \( \frac{6x - 6}{7} + 5 = 11 \) (Hint: remember order of operations.)

3. What advice would you give to a student about when to work backward to solve a problem?

On today's activity: (Circle one) ➤ I need to know more. ➤ I got it.
Today's Challenge  Match the definitions in Column A with words in Column B. Write the letter of your answer in the space provided.

Column A            Column B
_____ 1. A five-sided polygon       a. right angle
_____ 2. An angle measuring less than 90°  b. trapezoid
_____ 3. A quadrilateral with opposite sides parallel  c. square
_____ 4. A triangle with two congruent sides  d. octagon
_____ 5. A quadrilateral with exactly one pair of parallel sides  e. parallel lines
_____ 6. An angle that measures greater than 90°  
               but less than 180°  f. pentagon
_____ 7. An eight-sided polygon  g. perimeter
_____ 8. A quadrilateral with four congruent angles and four congruent sides  h. perpendicular
_____ 9. Two lines that intersect to form 90° angles  i. acute angle
_____10. The distance around a circle  j. parallelogram
_____11. An angle measuring exactly 90°  k. circumference
_____12. Two lines that are always the same distance apart  l. isosceles
_____13. The distance around a polygon  m. obtuse angle

Go Further  Give a specific name for each polygon.

14.  

15.  

16.  

17.  

On today's activity: (Circle one)  I need to know more.  I got it.

Name  Date
Today's Challenge = Roll a Product

Work in a group of three. Decide who will be Players A, B, and C by putting your first names in alphabetical order. When two cubes are rolled, there are 18 different possible products. Those products have been arranged in hexagons labeled Player A, Player B, and Player C. Take turns rolling two cubes and multiplying the numbers that land face up. Mark the product in your hexagon. If a product has already been marked, you miss that turn. When all numbers in a hexagon have been marked, that player is declared the winner. Play two games. Record in the table at the front of the room which player won each game.

1. Based on the class results, do you think the game is fair? ____________

2. To help you understand whether the game is fair, fill in these tables and record the number of times each product occurs.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td></td>
<td></td>
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<td>5</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total

3. Based on the data in exercise 2, do you want to change your answer to exercise 1? Explain why you think this is or is not a fair game.

____________________________________________________________________

____________________________________________________________________

On today's activity: (Circle one) ☐ I need to know more. ☐ I got it.

Name ___________________________ Date ___________________________
Go Further  Roll a Product

Last time, you found that the numbers in the three hexagons were not arranged so that each player had an equal opportunity to win. Today you will try to create three hexagons that will give each of the three players an equal chance of winning. Study your results from page 22. Record some of the things you discovered about outcomes of rolling products, such as which numbers are most likely to be rolled and which numbers are least likely to be rolled. Record these and other observations here.

**Things we discovered:**

1. What should be the probability that Player A will win if the game is going to be fair?

2. Use your discoveries to create three hexagons, each of which is equally likely to win.

![Hexagons for Players A, B, and C]

3. Do you think there is more than one way to create a fair game? Explain.

---

**On today's activity:** (Circle one)  I need to know more.  I got it.

**Name**  **Date**
### Get Started

#### Example 1

<table>
<thead>
<tr>
<th>Volume: 40 cubic centimeters</th>
<th><img src="image1" alt="Diagram" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>4 cm 2 cm</td>
<td>h = ___</td>
</tr>
</tbody>
</table>

#### Example 2

<table>
<thead>
<tr>
<th>Volume: 40 cubic centimeters</th>
<th><img src="image2" alt="Diagram" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 cm</td>
<td>w = ___</td>
</tr>
</tbody>
</table>

### Today's Challenge

<table>
<thead>
<tr>
<th></th>
<th><img src="image3" alt="Diagram" /></th>
<th><img src="image4" alt="Diagram" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Volume: 48 cubic centimeters</td>
<td>h = ___</td>
</tr>
<tr>
<td></td>
<td>4 cm 3 cm</td>
<td>w = ___</td>
</tr>
<tr>
<td>3.</td>
<td>Volume: 48 cubic yards</td>
<td>2 yd w = ___</td>
</tr>
<tr>
<td></td>
<td>6 yd</td>
<td>h = ___</td>
</tr>
<tr>
<td>5.</td>
<td>Volume: 64 cubic inches</td>
<td>8 in. w = ___</td>
</tr>
<tr>
<td></td>
<td>4 in.</td>
<td>h = ___</td>
</tr>
<tr>
<td>7.</td>
<td>Volume: 64 cubic kilometers</td>
<td>4 km l = ___</td>
</tr>
<tr>
<td></td>
<td>4 km</td>
<td>l = ___</td>
</tr>
<tr>
<td>9.</td>
<td>Volume: 60 cubic feet</td>
<td>h = ___</td>
</tr>
<tr>
<td></td>
<td>6 ft 2 ft</td>
<td>w = ___</td>
</tr>
<tr>
<td>11.</td>
<td>Volume: 60 cubic millimeters</td>
<td>2 mm w = ___</td>
</tr>
<tr>
<td></td>
<td>10 mm</td>
<td>h = ___</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th><img src="image5" alt="Diagram" /></th>
<th><img src="image6" alt="Diagram" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Volume: 48 cubic centimeters</td>
<td>l = ___</td>
</tr>
<tr>
<td></td>
<td>2 cm</td>
<td>w = ___</td>
</tr>
<tr>
<td>4.</td>
<td>Volume: 48 cubic yards</td>
<td>h = ___</td>
</tr>
<tr>
<td></td>
<td>8 yd</td>
<td>l = ___</td>
</tr>
<tr>
<td>6.</td>
<td>Volume: 64 cubic inches</td>
<td>h = ___</td>
</tr>
<tr>
<td></td>
<td>8 in.</td>
<td>h = ___</td>
</tr>
<tr>
<td>8.</td>
<td>Volume: 64 cubic kilometers</td>
<td>l = ___</td>
</tr>
<tr>
<td></td>
<td>2 km</td>
<td>l = ___</td>
</tr>
<tr>
<td>10.</td>
<td>Volume: 60 cubic feet</td>
<td>h = ___</td>
</tr>
<tr>
<td></td>
<td>15 ft</td>
<td>w = ___</td>
</tr>
<tr>
<td>12.</td>
<td>Volume: 60 cubic millimeters</td>
<td>w = ___</td>
</tr>
<tr>
<td></td>
<td>5 cm</td>
<td>w = ___</td>
</tr>
</tbody>
</table>

**On today's activity:** (Circle one) ☐ I need to know more. ☑️ I got it.
Get Started  Fill in the letter of the correct answer. Use benchmark fractions to help you estimate the difference. Briefly explain why you did or did not choose each answer choice.

\[5 \frac{2}{5} - 2 \frac{5}{8}\]

A) 3 \frac{3}{40}  
C) 2 \frac{31}{40}  
B) 3 \frac{1}{40}  
D) 2 \frac{7}{40} 

Today's Challenge  Fill in the letter of the correct answer. Use benchmark fractions to find a good estimate for the sums and differences.

1. \[2 \frac{2}{3} + 1 \frac{1}{4}\]
A) 3 \frac{11}{12}  
B) 4 \frac{1}{12}  
C) 4 \frac{1}{6}  
D) 3 \frac{3}{4}

5. \[3 \frac{2}{7} + 2 \frac{1}{4} + 2 \frac{1}{5}\]
A) 7 \frac{4}{35}  
B) 8 \frac{3}{140}  
C) 8 \frac{9}{14}  
D) 7 \frac{123}{140}

2. \[4 \frac{3}{7} - 1 \frac{2}{3}\]
A) 3 \frac{2}{21}  
B) 2 \frac{2}{21}  
C) 2 \frac{16}{21}  
D) 3 \frac{5}{21}

6. \[5 \frac{4}{7} - 2 \frac{3}{8}\]
A) 2 \frac{1}{28}  
B) 3 \frac{11}{56}  
C) 2 \frac{51}{56}  
D) 2 \frac{13}{56}

3. \[12 \frac{3}{5} - 5 \frac{1}{4}\]
A) 6 \frac{17}{20}  
B) 7 \frac{7}{20}  
C) 7 \frac{17}{20}  
D) 6 \frac{19}{20}

4. \[\frac{5}{9} + \frac{1}{4} + \frac{1}{3}\]
A) 1 \frac{5}{36}  
B) 2 \frac{9}{36}  
C) 1 \frac{17}{18}  
D) 1 \frac{19}{36}

5. \[3 \frac{3}{7} + 2 \frac{1}{4} + 2 \frac{1}{5}\]
A) 7 \frac{4}{35}  
B) 8 \frac{3}{140}  
C) 8 \frac{9}{14}  
D) 7 \frac{123}{140}

7. What advice would you give to students about estimating the sums or differences of fractions and mixed numbers?

On today's activity: (Circle one)  I need to know more.  I got it.

Name  Date
Today's Challenge: Compare the decimals and fractions by inserting >, <, or = in the space provided.

1. $0.125 \underline{\quad} \frac{1}{2}$
2. $0.75 \underline{\quad} \frac{3}{4}$
3. $0.4 \underline{\quad} \frac{1}{4}$
4. $0.85 \underline{\quad} \frac{4}{5}$
5. $0.3 \underline{\quad} \frac{1}{3}$
6. $0.9 \underline{\quad} \frac{1}{9}$
7. $0.7 \underline{\quad} \frac{7}{10}$
8. $0.65 \underline{\quad} \frac{2}{3}$
9. $0.05 \underline{\quad} \frac{1}{5}$
10. $0.5 \underline{\quad} \frac{1}{2}$

Go Further: Fill in the table of equivalent decimals and fractions. Write fractions in simplest form.

<table>
<thead>
<tr>
<th>Decimal</th>
<th>Fraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>$\frac{4}{5}$</td>
</tr>
<tr>
<td>12.</td>
<td>0.75</td>
</tr>
<tr>
<td>13.</td>
<td>$\frac{3}{8}$</td>
</tr>
<tr>
<td>14.</td>
<td>0.25</td>
</tr>
<tr>
<td>15.</td>
<td>0.4</td>
</tr>
</tbody>
</table>

On today's activity: (Circle one) I need to know more. I got it.
Today’s Challenge: Representing Rational Numbers in Decimal Form

Write these fractions as decimals. Show the repeating part of each decimal by placing a bar above the digits that repeat. You may use a calculator except for exercises 10–11.

1. \( \frac{1}{7} \)  
2. \( \frac{2}{7} \)  
3. \( \frac{3}{7} \)

4. \( \frac{4}{7} \)
5. \( \frac{5}{7} \)
6. \( \frac{6}{7} \)

7. \( \frac{8}{7} \)
8. \( \frac{9}{7} \)
9. \( \frac{10}{7} \)

10. How many places long is the repeating part of decimal when you divide by seven? ________

11. Predict the decimal equivalent of \( \frac{11}{7} \). ________

12. \( \frac{1}{11} \)
13. \( \frac{2}{11} \)
14. \( \frac{3}{11} \)

15. \( \frac{1}{6} \)
16. \( \frac{2}{6} \)
17. \( \frac{4}{6} \)

18. \( \frac{5}{6} \)
19. \( \frac{7}{6} \)
20. \( \frac{8}{6} \)

21. \( \frac{1}{13} \)
22. \( \frac{2}{13} \)
23. \( \frac{3}{13} \)

24. \( \frac{4}{13} \)
25. \( \frac{5}{13} \)
26. \( \frac{6}{13} \)

27. \( \frac{7}{13} \)
28. \( \frac{8}{13} \)
29. \( \frac{9}{13} \)

30. \( \frac{10}{13} \)
31. \( \frac{11}{13} \)
32. \( \frac{12}{13} \)

On today’s activity: (Circle one)  
I need to know more.  
I got it.

Name  
Date
Go Further = Representing Rational Numbers in Decimal Form

Work with a partner to study your work on page 27. Look at the repeating parts of the sevenths and thirteenths. What do you notice about them?

Things we discovered:

1. A. How many places are in the repeating part of the decimal equivalent to \(\frac{1}{7}\)?
   
2. A. How many places are in the repeating part of the decimal equivalent to \(\frac{2}{11}\)?
   
3. A. How many places are in the repeating part of the decimal equivalent to \(\frac{4}{6}\)?
   
4. A. How many places are in the repeating part of the decimal equivalent to \(\frac{7}{13}\)?
   
5. Study parts A and C for exercises 1–4. If fraction \(\frac{x}{n}\) is in simplest form and its decimal equivalent repeats, what relationship will you see between the number of places in the repeating part of the decimal equivalent and the factors of \(n - 1\)?

On today's activity: (Circle one) I need to know more. I got it.

Name

Date
Today’s Challenge  Find values for \( x \) and \( y \) that satisfy the equation \( 3x + 2 = y \). Your solution should be written as an ordered pair \((x, y)\). You may add the negative sign to create negative values. For example, the ordered pair \((-5, -13)\) is a solution to \(3x + 2 = y\) and it is found in the grid.

1. \( (__, __), (__, __), (__, __), __)\),
   \( (__, __), (__, __), (__, __), __)\),
   \( (__, __), (__, __)\)

Go Further  Graph your ordered pairs.

2. Use these axes to plot the ordered pairs that you found.

3. What observation can you make about the points that you plotted?

On today’s activity: (Circle one)  I need to know more.  I got it.

Name  
Date  29
Get Started

In a recent poll of 70 seventh graders, 42 of them said that they liked math. Twelve liked both math and science, but not English; 11 liked both math and English; seven liked all three subjects. Fourteen students liked English but not math; 13 of these liked both English and science. Twelve students liked only science.

Diagram the data, then answer the following questions about the survey results.

A. How many students liked mathematics and/or English, but did not like science? ______

B. How many students only liked mathematics? ______

C. How many students only liked English? ______

D. How many students did not like any of the three subjects listed? ______

Today's Challenge  ➤ Make a Venn diagram, then answer the questions.

On a pop quiz given to a geography class, the 27 students were asked to locate England, Spain, and France on an unmarked map. Information about the results is given below; use it to answer the questions.

Five students were able to correctly locate all three countries and three students could not locate any of the countries. Eight students knew where both England and France were and seven knew where both England and Spain were. Two students knew where Spain was but did not know where either England or France was located. A total of 16 students located England, 11 could locate Spain, and 14 could locate France.

1. How many students could locate England and France but not Spain? ______

2. How many students could locate England and Spain but not France? ______

3. How many students could only locate England? ______

4. How many students could locate Spain and France? ______

5. How many students could locate only France? ______

6. How many students could locate at least two of the countries? ______

7. What advice would you give to a student constructing a Venn diagram?

On today's activity: (Circle one) ➤ I need to know more. ➤ I got it.
Today's Challenge: Fill in this table by adding the integer at the top of the column to the integer at the left of the row. Write your sum in simplest form.

<table>
<thead>
<tr>
<th>+</th>
<th>-12</th>
<th>-7</th>
<th>3</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>-14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>-8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Go Further

4. Write and illustrate three different integer-addition problems. The addends should have opposite signs and their sum should be -5.

5. Write and illustrate three different integer-addition problems. The addends should have opposite signs and their sum should be eight.

On today's activity: (Circle one) I need to know more. I got it.

Name

Date
Today's Challenge: Checkerboard Pennies

Imagine filling a chessboard with pennies.

1. How many pennies would you need to have if you wanted to put one penny on each square? ________
   Two pennies? ________

2. Predict the number of pennies on the last square of a 25-square board if the first square has one penny and each square has twice the number of pennies as the square before.
   ________

3. Fill in the table with the number of pennies that would occupy each square if it had twice the number of pennies as the previous square.

<table>
<thead>
<tr>
<th>Square Number</th>
<th>Number of Pennies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
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<tr>
<td>3</td>
<td></td>
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<td>4</td>
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<td>11</td>
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<td>16</td>
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<td>18</td>
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<td>20</td>
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<tr>
<td>21</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

4. Was your prediction for exercise 2 close? Explain.
   ____________________________
   ____________________________
   ____________________________

On today's activity: (Circle one)  I need to know more.  I got it.

Name ________ Date ________
Go Further: Checkerboard Pennies

In activity 32, square 25 has over $165,000 worth of pennies on it. Work in a small group to study your results from activity 32. Look for different ways to represent each number and to compute the number of pennies in any given square.

Things we discovered:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Many times in mathematics there are patterns to solving problems. This problem is no exception. Think about a full-size checkerboard.

1. What is the pattern to the number of pennies on each square?

________________________________________________________________________

2. How can you represent the number of pennies on the sixty-fourth square?

________________________________________________________________________

3. What is the approximate dollar value of the money on square 64?

________________________________________________________________________

4. Why does your calculator not help you find the exact value of the money on square 64?

________________________________________________________________________

On today’s activity: (Circle one) ☐ I need to know more. ☐ I got it.

Name

Date
Go Further. Follow the directions to mark numbers in the grid. Some will be marked more than once.

1. Cross out all numbers that are less than three units from \(-5\).
2. Circle all numbers that are greater than \(5 - (-3)\).
3. Star all numbers that are less than or equal to \(-2 - 4\).
4. Underline all numbers that are greater than or equal to \(-2 \times -1.5\).
5. Box all numbers that are not positive.
6. Which number is not marked?

7. Create your own “Fantastic Finalist” activity with integers for a friend to solve.

<table>
<thead>
<tr>
<th>17</th>
<th>-3</th>
<th>2</th>
<th>-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>-6</td>
<td>0</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>-13</td>
<td>-7</td>
<td>14</td>
</tr>
</tbody>
</table>

Friend’s name __________________________

On today’s activity: (Circle one) I need to know more. I got it.
Get Started

Tami and Teri were checking their answers to a homework exercise. Study the exercise. Without actually doing the division, figure out who is right. Explain how you knew.

Teri          Tami
\[ 457.2 \div 1.8 = 254 \] \[ 457.2 \div 1.8 = 25.4 \]

Explanation:

---

Today's Challenge

Mark the letter of the correct answer. Without doing the division, find the answer that makes sense for each exercise. Explain why each answer choice is correct or incorrect.

1. \[ 975 \div 3.9 \]
   - A. 25
   - B. 2500
   - C. 250
   - D. 2.5

2. \[ 1067 \div 2.2 \]
   - A. 485
   - B. 4850
   - C. 48.5
   - D. 0.485

3. \[ 435.54 \div 12.2 \]
   - A. 0.357
   - B. 35.7
   - C. 357
   - D. 3.57

4. \[ 1208 \div 30.2 \]
   - A. 40
   - B. 4
   - C. 4000
   - D. 400

5. What advice would you give to a student who is working on a division with decimals problem in multiple-choice format? As part of your answer, explain why it may not always be necessary to complete the division.

---

On today's activity: (Circle one)  I need to know more.  I got it.

Name

Date
Today's Challenge Find the least common multiple or greatest common factor for each pair of numbers.

Think: multiples of 12: 12, 24, 36, 48, 60 
multiples of 15: 15, 30, 45, 60 

The least common multiple of 12 and 15 is 60.

Think: factors of 12a: 1, 2, 3, 4, 6, a 
factors of 16a: 1, 2, 4, 8, a 

The greatest common factor of 12a and 16a is 4a.

1. Find the greatest common factor of 7a and 14a. _____
2. Find the least common multiple of 10 and 15. _____
3. Find the least common multiple of 6 and 12. _____
4. Find the greatest common factor of 40 and 25 _____
5. Find the greatest common factor of 8a and 12a. _____
6. Find the least common multiple of 8 and 3. _____
7. Find the greatest common factor of 9a and 6a. _____
8. Find the least common multiple of 15 and 9. _____
9. Find the least common multiple of 9 and 36. _____
10. Find the greatest common factor of 9 and 36. _____
11. Find the least common multiple of 12 and 24. _____
12. Find the greatest common factor of 12 and 24. _____

Go Further

13. Look back at exercises 9–12. If m is a factor of n, then find the least common multiple of m and n. _____

14. Look back at exercises 9–12. If m is a factor of n, then find the greatest common factor of m and n. _____

On today’s activity: (Circle one) I need to know more. I got it.
Today's Challenge = Euler's Formula

Leonhard Euler was a Swiss mathematician who discovered the relationship you will study today and next time.

1. Count the edges, vertices, and faces for these three-dimensional figures. Keep a record of your data in this table.

<table>
<thead>
<tr>
<th>Figure</th>
<th>Number of Faces</th>
<th>Number of Vertices</th>
<th>Number of Edges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>6</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Rectangular Prism</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Octahedron</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Truncated Pyramid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Square Pyramid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triangular Prism</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Find at least one classroom example of a polyhedron. Sketch it and count its faces, vertices, and edges.

On today's activity: (Circle one) ☻ I need to know more. ☐ I got it.

Name __________________________ Date ______
Go Further → Euler’s Formula

Many mathematical discoveries were made because a mathematician saw a pattern in data. Euler was no exception. Work with a partner. Study your work on page 37. Write your discoveries here.

Things we discovered:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

1. Write an equation that relates faces, vertices, and edges of a polyhedron. Explain your equation using a triangular pyramid.

________________________________________________________________________

Diagram

________________________________________________________________________

2. Here are two more polyhedrons.

   A. How many faces, vertices, and edges do they have?

________________________________________________________________________

B. Does your equation work with them? ________________________

C. If not, revise your equation here. ________________________

3. Euler’s Formula is $F + V = E + 2$.
   How does this formula compare to your equation?

________________________________________________________________________

On today’s activity: (Circle one)  I need to know more.  I got it.

Name ___________________________ Date ___________
Get Started

1. Complete the table.

<table>
<thead>
<tr>
<th>n</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>( n^2 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Complete the table.

<table>
<thead>
<tr>
<th>n</th>
<th>4</th>
<th>9</th>
<th>16</th>
<th>36</th>
<th>64</th>
<th>144</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \sqrt{n} )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Go Further

Solve these riddles.

3. **Clues:**
   - I am a perfect square.
   - I am a perfect cube.
   - Both of my digits are even.
   - What number am I? ______

4. **Clues:**
   - I am greater than 100 but less than 200.
   - If you take the square root of me, the result is a whole number.
   - The sum of my digits is four.
   - What number am I? ______

5. Now write your own riddle for a friend to solve.

**Clues:** __________________________

_______________________________

_______________________________

What number am I? ______

Friend’s name ___________________
Get Started Fill in the grid with the correct answer. Use estimation to help explain your decision about each answer choice.

6.2 \times 0.65

A. 403
B. 4.03
C. 0.403
D. 40.3

Today's Challenge Match each exercise with the correct filled-in grid. Use estimation with decimals to help you explain your reasoning.

1. 0.4 \times 28
2. 50.5 \times 0.8
3. 49 \times 0.17
4. 105 \times 0.3

A. 8 . 3 3
B. 1 1 . 2
C. 4 0 . 4
D. 3 1 . 5

5. What advice would you give to someone taking a test involving multiplication with decimals?

On today's activity: (Circle one) I need to know more. I got it.
Today’s Challenge  Find the value of each expression.

1. What is the value of $5x + 3$ if $x = -4$? _______
2. What is the value of $9 - x$ if $x = -2$? _______
3. What is the value of $4x - 1$ if $x = 8$? _______
4. What is the value of $12 + 5x$ if $x = -3$? _______
5. What is the value of $-4 + x^2$ if $x = 3$? _______
6. What is the value of $4x + 4$ if $x = -1$? _______
7. What is the value of $-3(x - 3)$ if $x = 8$? _______
8. What is the value of $8 + 4x$ if $x = -6$? _______
9. What is the value of $x^2 - 21$ if $x = 9$? _______
10. What is the value of $17 - 3x$ if $x = 5$? _______

Go Further

11. Find the value of the expression $2x + 3$ when the value for $x$ changes. Record your answers in the table.

<table>
<thead>
<tr>
<th>Expression</th>
<th>Value of $x$</th>
<th>Value of Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2x + 3$</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>$2x + 3$</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>$2x + 3$</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>$2x + 3$</td>
<td>-1</td>
<td></td>
</tr>
<tr>
<td>$2x + 3$</td>
<td>-2</td>
<td></td>
</tr>
<tr>
<td>$2x + 3$</td>
<td>-3</td>
<td></td>
</tr>
<tr>
<td>$2x + 3$</td>
<td>-4</td>
<td></td>
</tr>
</tbody>
</table>

12. Describe a pattern in your answers for exercise 11. _______

On today’s activity: (Circle one)  I need to know more.  I got it.

Name  

Date
Today's Challenge  Nets of a Cube

Here is a net of a cube. You know it is a net because it will fold into a cube.

Net 1

2 1
3
5 4
6

front: 4
right side: 1
left side: 5
top: 3
back: 2
bottom: 6

These are not different nets.

Reflection of Net 1

9
5 4
3
2 1

Rotation of Net 1

9
5 4
3
2 1

This is not a net because its parts do not connect along a whole side.

1. Use colored squares to help you try different combinations of six squares that could be nets of a cube. Make sketches of all the nets you find.

On today's activity: (Circle one)  I need to know more.  I got it.
Go Further  Nets of a Cube

Work with a partner. Study your work for activity 42. Look particularly for rotations and reflections that are duplicates of other nets. Organize your nets and try to decide whether you have all possible nets of a cube. One way to organize them is to cut them out of graph paper and tape them in an organized array on a separate sheet of paper after checking them by laying them on top of each other.

Things we discovered:


1. How did you group the nets to be sure there are no missing nets?


2. There are eleven different nets for a cube. Did you get them all? _________
   If not, resume your search to find the missing ones.

On today's activity: (Circle one)  I need to know more.  I got it.

Name

Date
Today's Challenge

Example 1

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{1}{3}$ of 24</td>
<td>____ % of 32</td>
</tr>
</tbody>
</table>

Example 2

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>____ of 40</td>
<td>200% of 16</td>
</tr>
</tbody>
</table>

Complete the table so that the value represented in the fraction column equals the value represented in the percent column.

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{1}{8}$ of 80</td>
<td>____ % of 40</td>
</tr>
<tr>
<td>____ of 60</td>
<td>33(\frac{1}{3}) % of 45</td>
</tr>
<tr>
<td>$\frac{3}{4}$ of 48</td>
<td>____ % of 24</td>
</tr>
<tr>
<td>____ of 48</td>
<td>50% of 24</td>
</tr>
<tr>
<td>____ of 135</td>
<td>75% of 60</td>
</tr>
<tr>
<td>$\frac{4}{5}$ of 60</td>
<td>____ % of 16</td>
</tr>
<tr>
<td>$\frac{3}{10}$ of 80</td>
<td>____ % of 96</td>
</tr>
<tr>
<td>____ of 144</td>
<td>90% of 80</td>
</tr>
<tr>
<td>____ of 45</td>
<td>33(\frac{1}{3}) % of 45</td>
</tr>
<tr>
<td>$\frac{2}{5}$ of 40</td>
<td>____ % of 24</td>
</tr>
</tbody>
</table>

On today's activity: (Circle one) I need to know more.  I got it.
Get Started

Art Studio was taking a test on area and circumference of a circle. Here are four examples of Art’s work. Mark the letter of each problem that Art has done correctly, then correct his mistakes.

A. \( A = 64\pi \text{ sq. cm} \) ________________
B. \( C = 8\pi \text{ cm} \) ________________
C. \( A = 144\pi \text{ sq. in.} \) ________________
D. \( C = 12\pi \text{ in.} \) ________________
E. \( A = 196\pi \text{ sq. ft} \) ________________
F. \( C = 14\pi \text{ ft} \) ________________
G. \( A = 36\pi \text{ sq. ft} \) ________________
H. \( C = 6\pi \text{ ft} \) ________________

Today’s Challenge

1. Circle the letter of each circle for which you think Art would find the correct area. Write the area and circumference of each.

A. \( \text{16 in.} \)
   \( A = \) _____ \( C = \) _____
B. \( \text{30 cm} \)
   \( A = \) _____ \( C = \) _____
C. \( \text{4 cm} \)
   \( A = \) _____ \( C = \) _____
D. \( \text{18 in.} \)
   \( A = \) _____ \( C = \) _____

2. What advice would you give Art about finding the area and circumference of a circle?

________________________________________________________________________
________________________________________________________________________

On today’s activity: (Circle one)  ❌ I need to know more. ✔ I got it.

Name ______________________________ Date _______
Today's Challenge — Find the sum. Write your sum in simplest form.

1. \(1 \frac{1}{4} + \frac{2}{3} = \) _____ A
2. \(1 \frac{5}{6} + \frac{1}{3} = \) _____ R
3. \(\frac{3}{4} + \frac{3}{4} = \) _____ C
4. \(\frac{5}{6} + \frac{5}{6} = \) _____ M
5. \(1 \frac{1}{2} + \frac{1}{3} = \) _____ O
6. \(1 \frac{3}{4} + \frac{3}{4} = \) _____ T
7. \(1 \frac{1}{6} + \frac{1}{6} = \) _____ F
8. \(2 \frac{1}{2} + \frac{3}{4} = \) _____ S
9. \(2 \frac{5}{6} + \frac{1}{3} = \) _____ N
10. \(1 \frac{1}{3} + \frac{2}{3} = \) _____ U
11. \(2 \frac{3}{4} + \frac{1}{3} = \) _____ I

12. Record the letter of the answer that corresponds to the mixed number below each line to spell a message.

\[
\begin{align*}
1 \frac{1}{3} & \quad 2 \frac{1}{6} \\
1 \frac{11}{12} & \quad 1 \frac{1}{2} \\
2 \frac{1}{2} & \quad 3 \frac{1}{12} \\
1 \frac{5}{6} & \quad 3 \frac{1}{6} \\
3 \frac{1}{4} & \quad 2 \frac{2}{3} \\
1 \frac{1}{3} & \quad 2 \frac{3}{6}
\end{align*}
\]

Go Further — Share your expressions for exercises 13–14 with a friend. If you disagree on the sums, edit your work.

13. Write two fraction-addition expressions with unlike denominators whose sum is two.

   
   

14. Write two fraction-addition expressions with unlike denominators whose sum is \(2 \frac{1}{2}\).

   
   

Friend’s name _____________________________

On today's activity: (Circle one) — I need to know more. — I got it.
Today's Challenge = Generating Prime Numbers

There is an expression that is being used today by computers to find very large prime numbers. These numbers are useful for encrypting computer programs and files. This expression for generating possible prime numbers, $2^n - 1$, was developed by French mathematician Marin Mersenne.

1. Test Mersenne's formula for $n = 1-10$ to see what prime numbers it will generate for you. Decide whether your result is prime or composite and write your results in the table.

$$| n | 2^n - 1 | \text{Prime or Composite?} |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On today's activity: (Circle one) I need to know more. I got it.
Go Further — Generating Prime Numbers

Last time, you made a list of prime numbers generated by the expression $2^n - 1$. Work with a partner. Compare $n$ and $2^n - 1$ for each case and look for a pattern.

Things we discovered:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

1. What prime numbers will $2^n - 1$ generate for $n = 1$–10?

2. Do you think the formula will generate a prime number for $n = 11$?

3. Test $n = 11$ in the formula $2^n - 1$, then test the result for factors. What happened? Do you think it will happen again?

________________________________________________________________________

4. How can you tell whether $2^n - 1$ will generate a prime number?

________________________________________________________________________

________________________________________________________________________

5. What is the next prime number after $n = 11$ generated by the formula? Explain how you found it.

________________________________________________________________________

On today’s activity: (Circle one)  ■ I need to know more.  ■ I got it.

Name

Date
Today’s Challenge  Look for strings that contain $x$ and $x^3$. Fill in the table with each perfect square you find.

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>$x$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$x^2$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Go Further  Look for other powers. Use the box of jumbled numbers.

2. Find strings that can be un-jumbled to show $x$ and $x^3$.

3. Find strings that can be un-jumbled to show $x$ and $x^4$.

4. Find strings that can be un-jumbled to show $x$ and $x^5$.

5. Find strings that can be un-jumbled to show $x$ and $x^6$.

6. Who am I? I am a perfect square, a perfect cube, and a perfect sixth power.

On today’s activity: (Circle one)  I need to know more.  I got it.

Name  Date
Get Started

This diagram has more information than you need. Cross out the information you do not need to find the area. Make a list of the information that you do need, then find the area.

\[ A = \] __________

Today's Challenge  
Cross out all the information you do NOT need to find the area. List the information you do need, then compute the area.

1. **Rectangle FACE**
   
   ![Rectangle FACE Diagram]

   \[ A = \] __________

2. **Triangle WHY with altitude HU**
   
   ![Triangle WHY with altitude HU Diagram]

   \[ A = \] __________

3. **Circle O with diameter AD**
   
   ![Circle O with diameter AD Diagram]

   \[ A (\text{in terms of } \pi) = \] __________

4. **Parallelogram IRON with altitude ID**
   
   ![Parallelogram IRON with altitude ID Diagram]

   \[ A = \] __________

5. What advice would you give to someone using a diagram on a test?

   __________

---

On today's activity: (Circle one)  
- I need to know more.  
- I got it.

---

50 Name  
Date
**Today’s Challenge**  Match the expression in Column A with the correct value in Column B. Record the letter of your answer in the space provided.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>___ 1. $</td>
<td>8 - (-6)</td>
</tr>
<tr>
<td>___ 2. $</td>
<td>5 - (-11)</td>
</tr>
<tr>
<td>___ 3. $</td>
<td>9 + (-4)</td>
</tr>
<tr>
<td>___ 4. $</td>
<td>-8 + 2</td>
</tr>
<tr>
<td>___ 5. $</td>
<td>8 - (-6)</td>
</tr>
<tr>
<td>___ 6. $</td>
<td>5 + (-5)</td>
</tr>
<tr>
<td>___ 7. $</td>
<td>-8</td>
</tr>
<tr>
<td>___ 8. $</td>
<td>9 + (-4)</td>
</tr>
<tr>
<td>___ 9. $</td>
<td>5 + (-5)</td>
</tr>
<tr>
<td>___ 10. $</td>
<td>5 - (-11)</td>
</tr>
</tbody>
</table>

**Go Further**

11. Write three of your own absolute value expressions. Share your problems with a friend, then edit your work if your answers do not agree.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

Friend’s name ____________________________

**On today’s activity:** (Circle one)  I need to know more.  I got it.
Today's Challenge  Counting Squares

1. How many squares are in each figure? Count only squares that have vertical and horizontal sides.

Figure 1
• •
• •

Figure 2
• • • •
• • • •

Figure 3
• • • • • •
• • • • • •

Figure 4
• • • • • • • •
• • • • • • • •

Figure 5
• • • • • • • •
• • • • • • • •

Results:


On today's activity: (Circle one) ☐ I need to know more. ☐ I got it.
Go Further  Counting Squares

Work with a partner. Study your work from page 52 and the class data.

1. Organize the data from page 52 into this table. The first is done for you. Describe any patterns you see in the table.

<table>
<thead>
<tr>
<th>Figure</th>
<th>Original Dimensions</th>
<th>$1 \times 1$ Squares</th>
<th>$2 \times 2$ Squares</th>
<th>$3 \times 3$ Squares</th>
<th>$4 \times 4$ Squares</th>
<th>$5 \times 5$ Squares</th>
<th>Total Number of Squares</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$1 \times 1$</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Things we discovered: __________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

2. A checkerboard’s dimensions are $8 \times 8$. Use your patterns to decide how many different squares are on a checkerboard. Explain your reasoning.

________________________________________________________________
________________________________________________________________

On today’s activity: (Circle one) I need to know more. I got it.

Name __________________________ Date _________
Go Further  Follow the directions to mark fractions in the grid.

\[
\begin{array}{|c|c|c|c|}
\hline
\frac{2}{3} & \frac{6}{8} & \frac{2}{4} & \frac{3}{9} \\
\hline
\frac{6}{10} & \frac{1}{4} & \frac{2}{8} & \frac{4}{5} \\
\hline
\frac{3}{4} & \frac{2}{5} & \frac{4}{6} & \frac{8}{10} \\
\hline
\frac{1}{3} & \frac{4}{10} & \frac{3}{5} & \frac{1}{2} \\
\hline
\end{array}
\]

1. Cross out all fractions equivalent to 0.6.
2. Circle all fractions equivalent to 0.\bar{6}.
3. Star all fractions equivalent to 0.\bar{3}.
4. Underline all fractions equivalent to 0.75.
5. Box all fractions equivalent to 0.25.
6. Shade squares containing fractions equivalent to 0.8.
7. Draw a triangle around all fractions equivalent to 0.4.
8. Write the decimal equivalent of the unmarked pair of fractions. _____

For exercises 9–10, write two fractions equivalent to the given decimal.

Example: \(0.7 = \frac{7}{10} = \frac{14}{20}\)

9. \(0.2\) _________
10. \(0.125\) _________

On today’s activity: (Circle one) \(\) I need to know more. \(\) I got it.
Get Started  Mark the letter of each correct solution. Use estimation to eliminate some of the answer choices. Explain your thinking for each choice.

\[ 8\frac{1}{3} \div 2\frac{1}{6} \]
A. 12\frac{5}{18}  
B. 3\frac{11}{13}  
C. 10\frac{5}{6}  
D. 6\frac{5}{12}  

Today's Challenge  Mark the letter of the correct answer. Explain how you used estimation to eliminate incorrect answer choices.

1. \[ 8\frac{1}{2} \div 1\frac{1}{3} \]
   A. 6\frac{3}{8}  
   B. 2\frac{5}{6}  
   C. 12\frac{5}{6}  
   D. 10\frac{1}{6}  

2. \[ 6\frac{2}{3} \div 2\frac{2}{3} \]
   A. 2\frac{1}{2}  
   B. 4\frac{1}{2}  
   C. 8\frac{3}{4}  
   D. 9\frac{1}{2}  

3. \[ 4\frac{1}{2} \div 1\frac{2}{3} \]
   A. 4\frac{2}{3}  
   B. 2\frac{7}{10}  
   C. 6\frac{1}{2}  
   D. 1\frac{1}{3}  

4. \[ 6\frac{3}{8} \div 2\frac{5}{8} \]
   A. 6\frac{1}{2}  
   B. 1\frac{1}{2}  
   C. 2\frac{3}{7}  
   D. 4\frac{1}{8}  

5. What advice would you give about eliminating some answer choices in a multiple choice test on dividing mixed numbers?


On today's activity: (Circle one)  I need to know more.  I got it.

Name  Date
Today's Challenge  Solve for the variable \( n \). Describe the operation you performed to solve the equation.

1. \( n - 13 = -4 \) ________________________  2. \( n + 9 = 28 \) ________________________  
3. \( -9n = 54 \) ________________________  4. \( 11 - n = 16 \) ________________________  
5. \( \frac{n}{12} = -6 \) ________________________  6. \( 2n + 8 = 16 \) ________________________  
7. \( n^2 = 121 \) ________________________  8. \( 12n = -96 \) ________________________  
9. \( 5n - 20 = 25 \) ________________________  10. \( 10n + 35 = 145 \) ________________________

Go Further  Write questions for these answers.

Example:
If the answer is \( n = 8 \), you could write
\( 5n = 40, \ n = ? \) or
\( -40 \div n = -5, \ n = ? \) or
\( n + 7 = 15, \ n = ? \) or
\( 22 - n = 14, \ n = ? \)

11. Answer: \( n = 7 \)  Question: ________________________
12. Answer: \( n = -4 \)  Question: ________________________
13. Answer: \( n = 13 \)  Question: ________________________
14. Answer: \( n = -8 \)  Question: ________________________
15. Answer: \( n = 22 \)  Question: ________________________

Friend's name ________________________

On today's activity: (Circle one)  I need to know more.  I got it.
Today's Challenge  =  Digit Roots

A digit root is the sum of the digits of a number unless that sum is greater than nine. In that case, the digit root is the first sum of digits that is less than ten.

Examples: 23 → 2 + 3 → 5
           174 → 1 + 7 + 4 → 12 → 1 + 2 → 3

1. For each base number in the tables, record the next nine multiples on the left and the digit roots on the right. The multiples and digit roots for two have been done for you.

<table>
<thead>
<tr>
<th>Base Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Multiples and Digit Roots</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td>14</td>
</tr>
<tr>
<td>16</td>
</tr>
<tr>
<td>18</td>
</tr>
<tr>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Base Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Multiples and Digit Roots</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
</tbody>
</table>

On today's activity: (Circle one)  I need to know more.  I got it.
Go Further  Digit Roots

Work with a partner. Study your work on activity 57 to find patterns in the digit root cycles.

Things we discovered:

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

1. Which numbers have similar digit root patterns? What is the pattern?
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

2. Which digit root patterns could be used as divisibility tests? Explain.
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

On today's activity: (Circle one)  I need to know more.  I got it.
Game Time

Get Started

1. Complete the table.

<table>
<thead>
<tr>
<th>Word Name</th>
<th>Fraction Form</th>
<th>Decimal Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>one ninth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>one sixth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>two ninths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>one third</td>
<td></td>
<td></td>
</tr>
<tr>
<td>four ninths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>two thirds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>five sixths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>seven ninths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>eight ninths</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Go Further

Solve the riddles with numbers from the Get Started table.

2. **CLUES:**
   - I can be written as a decimal with its only non-repeating digit in the tenths place.
   - I am greater than 15% but less than 25%.
   - In simplest form, I have a one-digit denominator.
   - What is my fraction name? ______

3. **CLUES:**
   - I can be written as a decimal with a repeating six.
   - I am greater than one half and less than 0.7.
   - I can be written as a fraction with a two in the numerator.
   - What is my fraction name? ______

4. Now write your own riddle for a friend to solve.

   **CLUES:__________________________________________________________
   __________________________________________________________________
   __________________________________________________________________
   __________________________________________________________________

   What is my decimal name? ______

   Friend’s name ________________________________________

On today’s activity: (Circle one) I need to know more. I got it.

Name  Date
Get Started  Study the constructed response.

Problem: Kandee believes that when you multiply two numbers, the product is always greater than either of the factors. Is she right? If not, for what kinds of numbers is the statement false?

Solution: 
First check to see whether this is true for values greater than one. 
\[ 2 \times 6 = 12 \text{ The statement is true.} \]
\[ 1 \frac{1}{2} \times 2 \frac{3}{4} = 4 \frac{1}{8} \text{ The statement is true.} \]

Check the statement with one or both values between zero and one. 
\[ 3 \times \frac{1}{2} = 1 \frac{1}{2} \text{ The statement is false.} \]
\[ \frac{1}{4} \times \frac{1}{4} = \frac{1}{16} \text{ The statement is false.} \]

Check with negative values for one or both factors. 
\[ 5 \times -2 = -10 \text{ The statement is false.} \]
\[ -5 \times -2 = 10 \text{ The statement is true.} \]

Check with zero as a factor. 
\[ 0 \times 6 = 0. \text{ The statement is false.} \]

Write a clear, complete answer to the question. 
Kandee is not right. When one factor is less than one, the product is less than at least one of the factors. When both factors are between zero and one, the product is less than both factors.

Today's Challenge  On another piece of paper, write a constructed response for each problem.

1. Pete thinks that whenever you divide, the quotient is always less than either the divisor or the dividend. Is he right? If not, for what kinds of numbers is the statement false?

2. Arianna thinks that when you square a number, the result has to be greater than the original number. Is she right? If not, for what kinds of numbers is the statement false?

3. What advice would you give to a student who needs to write a constructed response to a question about how the results of a mathematical operation compare to the original numbers?

On today's activity: (Circle one)  I need to know more.  I got it.
Today's Challenge  Fill in the blanks in this table of equivalent values.

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Decimal</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.  (\frac{2}{3})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td>3.  (\frac{1}{100})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>6.  (\frac{1}{8})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>8.  (\frac{3}{5})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>0.95</td>
<td></td>
</tr>
<tr>
<td>10.  (\frac{11}{20})</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Go Further

11. Write these fractions, decimals, and percents in order from least to greatest on the number line.

<table>
<thead>
<tr>
<th>5%</th>
<th>0.75</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\frac{3}{8})</td>
<td>0.3</td>
</tr>
<tr>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>(\frac{2}{3})</td>
<td>0.6</td>
</tr>
<tr>
<td>85%</td>
<td></td>
</tr>
<tr>
<td>(\frac{9}{10})</td>
<td></td>
</tr>
</tbody>
</table>

On today's activity: (Circle one)  I need to know more.  I got it.

Name  Date
Today's Challenge: Crossing the River

Two families (four adults and two children) were hiking when they came to a river that they had to cross. At the river there was a boat available for crossing, but the boat could only hold at most one adult or two children. There was a strong current, so they could not just float the boat back for more passengers.

1. Explain how to get an adult to the other side and send the boat back to pick up another adult.

2. Draw a diagram or make a table to show how the six people can cross the river in the least number of trips. If you need to, use another piece of paper.

3. There are two children in a group that needs to cross the same river. What is the least number of trips needed if the number of adults varies? Record your results in the table.

<table>
<thead>
<tr>
<th>Number of Adults</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Trips</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. There are no adults in a group that needs to cross the same river. What is the least number of trips needed if the number of children varies? Record your results in the table.

<table>
<thead>
<tr>
<th>Number of Children</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Trips</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On today’s activity: (Circle one) I need to know more. I got it.

Name
Date
Go Further  Crossing the River

Work with a partner to study your work on page 62. Write some things you discovered about crossing the river.

Things we discovered: ________________________________

___________________________________________________________________________________________________________

For exercises 1–4, assume that there are always exactly two children on the trip.

1. If \( t \) represents the number of trips and \( a \) represents the number of adults, write a formula for finding \( t \). __________________

2. If the number of adults is 27, how many trips will it take? ______

3. If the number of trips taken was 57, how many adults were there? ______

4. Mary said it took one group 63 trips to cross the river. Is that possible? Explain.

5. Study the table in activity 62 with no adults and a varying number of children. Write a formula for the number of trips, \( t \), needed for \( c \) children.

6. Revise the formula from exercise 5 to account for the additional number of trips needed for each adult.

7. Use the formula from exercise 6 to find out how many trips are needed if there are 12 adults and nine children. Remember, when \( c = 2, t = 4a + 1 \). ______

On today’s activity: (Circle one)  I need to know more.  I got it.

Name ___________________________________________ Date ________________
Today's Challenge  Find the value of each expression.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. If (x = -4), then (2x + 5 = ?)</td>
<td>2. If (x = -4), then (x + x = ?)</td>
</tr>
<tr>
<td>3. If (x = 8), then (\frac{1}{2}x - 15 = ?)</td>
<td>4. If (x = 4), then (-2(x + 3) = ?)</td>
</tr>
<tr>
<td>5. If (x = 9), then (7 - 2x = ?)</td>
<td>6. If (x = 2), then (\frac{1}{3}(x + 4) = ?)</td>
</tr>
<tr>
<td>7. If (x = -5), then (5x + 18 = ?)</td>
<td>8. If (x = 3), then (4x + 3 = ?)</td>
</tr>
<tr>
<td>9. If (x = -9), then (-3(x + 4) = ?)</td>
<td>10. If (x = 6), then (4 - 3x = ?)</td>
</tr>
<tr>
<td>11. If (x = 5), then (3 + 2x = ?)</td>
<td>12. If (x = -3), then (4x + 9 = ?)</td>
</tr>
<tr>
<td>13. If (x = -2), then (5x + 2 = ?)</td>
<td>14. If (x = 10), then (3 - x = ?)</td>
</tr>
<tr>
<td>15. If (x = -2), then (5(x + 1) = ?)</td>
<td>16. If (x = 4), then (4x - 3 = ?)</td>
</tr>
<tr>
<td>17. If (x = \frac{1}{2}), then (x + 3x = ?)</td>
<td>18. If (x = -7), then (2x + 4 = ?)</td>
</tr>
<tr>
<td>19. If (x = 0), then (7x - 10 = ?)</td>
<td>20. If (x = 4), then (3 - 2x = ?)</td>
</tr>
</tbody>
</table>

On today's activity: (Circle one)  
- I need to know more.  
- I got it.
Get Started  Mark the letter of the correct answer. Do not add. Instead, use what you know about the rules for adding integers and absolute value to evaluate this expression. Explain how you chose the correct answer.

71 + -45

A  26  B  -26
C  116  D  -116

Today's Challenge  Mark the letter of the correct answer. Without computing, find the value that makes sense for each expression. Explain why you decided on the answer you chose.

1. -34 + -28
   A  -6  B  6
   C  -62  D  +62

2. 96 + -35
   A  61  B  -61
   C  131  D  -131

3. 48 + -123
   A  171  B  -75
   C  -171  D  75

4. -97 + 59
   A  -38  B  38
   C  -156  D  156

5. -62 + | -14 |
   A  -76  B  76
   C  48  D  -48

6. |46| + | -46 |
   A  0  B  -92
   C  92  D  0

7. What advice would you give a student who was about to take a timed test on adding integers?

On today's activity: (Circle one)  I need to know more.  I got it.

Name

Date 65
Today's Challenge  Choose your answers from this box. You won't use every number.

1. What is greatest two-digit perfect cube?
2. What is the composite number whose factors, other than one and itself, are seven and 13?
3. What is the greatest two-digit prime number?
4. What is the number with a prime factorization: $2^3 \times 3^2$?
5. What is the greatest one-digit perfect cube?
6. What is the only odd number between 10 and 20 that is not prime?
7. What is the least number that is divisible by both 12 and nine?
8. What is a two-digit prime number? Its digits have a product that is prime.
9. What is a prime number between 20 and 30? Its digits have a sum of five.
10. What is the greatest two-digit multiple of three less than $2^4 \times 5$?

Go Further

11. Write the multiples of three less than 40.

12. Write the multiples of four less than 40.

13. Circle the numbers that are common to both lists. Describe the set of numbers that you circled.

14. Find three answers to exercise 8 other than the one you found in the box.

On today's activity: (Circle one) I need to know more. I got it.
Today's Challenge  Graphing Lines 1

Make a table of values for each equation. Substitute at least two positive numbers, two negative numbers, and zero for x-values. Plot the ordered pairs, connect the points for each equation and label your graphs.

1. \( y = x - 3 \)  
2. \( y = x + 4 \)  
3. \( y = x - 2 \)  
4. \( y = x \)  
5. \( y = x + 2 \)

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On today's activity: (Circle one)  
\[ \text{I need to know more.} \]  
\[ \text{I got it.} \]

Name  
Date
Go Further  Graphing Lines 1

Last time, you graphed five lines. Work with a partner. Study the equations for those lines to see what was the same and what varied each time. Now, look at the graphs to see what stayed the same and what varied. Write what you discovered here.

Things we discovered: _________________________

______________________________

______________________________

______________________________

______________________________

______________________________

1. If you were to graph the equation $y = x + 7$, what would it look like?

______________________________

2. Without graphing, describe the graph of the equation $y = x - 3.5$. ______________

______________________________

3. If a line parallel to $y = x$ passed through the point $(0, 3)$, what would be the equation of that line?

______________________________

4. In $y = x + a$, where $a$ is a real number, what does $a$ tell you about the graph of the equation?

______________________________

On today's activity: (Circle one) ☐ I need to know more. ☑ I got it.

Name ___________________________ Date ___________________________
Today's Challenge  Use a string of four digits in order from a row or column to write an expression using three different operations. At least one of your numbers must be negative. Use the order of operations to find the value of the expression.

<table>
<thead>
<tr>
<th>Expression</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
</tbody>
</table>

Go Further  Create your own Math Jumble. Have a friend use any row or any column in your Math Jumble to write an expression. They must use three different operations. Have your friend write an expression and then find its value. At least one of the numbers in the expression must be negative.

<table>
<thead>
<tr>
<th>Expression</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
</tbody>
</table>

Friend’s name ______________________

On today’s activity: (Circle one)  I need to know more.  I got it.
Get Started  Fill in the grid with the correct answer. Use the rules for divisibility to find the number that is divisible by 20 but not by 15. Explain your decision about each choice.

A. 3110  B. 4385
C. 2360  D. 4620

Today's Challenge  Fill in the appropriate grid with the correct answer. Use divisibility rules to help explain your reasoning.

1. Which of these numbers is divisible by six, but not by 12?
   A. 34,262
   B. 2316
   C. 4440
   D. 1542

2. Which of these numbers is divisible by 12 and by 20?
   A. 1000
   B. 3360
   C. 2550
   D. 2805

3. Which of these numbers is divisible by 15 but not by 12?
   A. 3790
   B. 6825
   C. 4260
   D. 8405

4. Which of these numbers is divisible by 18, but not by 15?
   A. 1008
   B. 1080
   C. 1890
   D. 4992

5. What advice would you give to someone taking a test involving divisibility testing? Think especially about numbers for which you do not have a rule (for example, 12, 15, or 24).

On today's activity: (Circle one)  I need to know more.  I got it.
Today's Challenge  Fill in the table by using the Distributive Property to expand the original expression.

The Distributive Property is used to expand expressions of the form \( a(b + c) \).

**Example:** \( 4(3x + 2) \rightarrow (4 \cdot 3x) + (4 \cdot 2) \rightarrow 12x + 8 \)

<table>
<thead>
<tr>
<th>Original Expression in Factored Form</th>
<th>Expanded Equivalent Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ( 4(2x - 3) )</td>
<td></td>
</tr>
<tr>
<td>2. ( \frac{1}{2}(10x + 4) )</td>
<td></td>
</tr>
<tr>
<td>3. ( -3(x - 2) )</td>
<td></td>
</tr>
<tr>
<td>4. ( \frac{2}{3}(6x - 12) )</td>
<td></td>
</tr>
<tr>
<td>5. ( 2(3x + 9) )</td>
<td></td>
</tr>
<tr>
<td>6. ( -\frac{1}{2}(4 - 2x) )</td>
<td></td>
</tr>
<tr>
<td>7. ( 3(8 + 4x) )</td>
<td></td>
</tr>
<tr>
<td>8. ( \frac{1}{4}(8x + 28) )</td>
<td></td>
</tr>
<tr>
<td>9. ( -4(5x - 3) )</td>
<td></td>
</tr>
<tr>
<td>10. ( -5(-3x - 2) )</td>
<td></td>
</tr>
</tbody>
</table>

**Go Further**  The distributive property is also used to expand expressions of the form \((a + b)c\).

**Example:** \((4x - 5)(-2) \rightarrow (4x \cdot -2) - (5 \cdot -2) \rightarrow -8x + 10\)

Use the Distributive Property to expand these expressions.

11. \((5x - 4)3 =\) __________________

12. \((2x + 8)\frac{1}{2} =\) __________________

13. \((3x - 10)(-2) =\) __________________

14. \((\frac{1}{2}x + 3)6 =\) __________________

On today's activity: (Circle one)  I need to know more.  I got it.
Today’s Challenge  -  Graphing Lines 2

Make a table of values for each equation, using at least two positive numbers, two negative numbers, and zero for x-values. Graph and label the first two equations on the first grid and the second two equations on the second grid.

1. \( y = 2x + 4 \)  
2. \( y = 3x + 4 \)  
3. \( y = -2x - 3 \)  
4. \( y = -x - 3 \)

\[
\begin{array}{c|c|c|c|c|c|}
\hline
x & \multicolumn{2}{c|}{y} & x & \multicolumn{2}{c|}{y} \\
\hline
& & & & & \\
\hline
\end{array}
\]

On today’s activity: (Circle one)  
- I need to know more.  
- I got it.

Name  

Date
Go Further  Graphing Lines 2

Work with a partner. Study and compare the equations and lines on page 72. Write what you discovered here.

Things we discovered:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

1. If you were to graph the equation \( y = 3x + 2 \), what would it look like?
________________________________________________________________________

2. Describe the graph of the equation \( y = -x \).
________________________________________________________________________

3. Describe the graph of the equation \( y = -2x + 5 \).
________________________________________________________________________

4. What could you say about the graphs of \( y = 4x - 3 \) and \( y = 4x + 1 \)?
________________________________________________________________________

5. What could you say about the graphs of \( y = -5x + 6 \) and \( y = -2x - 2 \)?
________________________________________________________________________

6. Which of these lines would have a steeper slant?
   - A. \( y = 5x - 2 \) or \( y = 2x + 4 \)
   - B. \( y = -6x - 1 \) or \( y = -3x + 7 \)
________________________________________________________________________

On today's activity: (Circle one)  I need to know more.  I got it.

Name  Date
Go Further  Follow the directions to mark numbers in the grid. Some will be marked more than once.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>108</td>
<td>27</td>
<td>95</td>
</tr>
<tr>
<td>54</td>
<td>36</td>
<td>50</td>
<td>80</td>
</tr>
<tr>
<td>120</td>
<td>72</td>
<td>76</td>
<td>24</td>
</tr>
<tr>
<td>64</td>
<td>48</td>
<td>18</td>
<td>99</td>
</tr>
</tbody>
</table>

1. The area of a rectangle is 72 square units and its length is nine units. Cross out all numbers that are multiples of the width of the rectangle.

2. The perimeter of a square is 36 units. Circle all numbers that are multiples of the length of a side of the square.

3. The area of a triangle is 12 square units and its base is four units long. Star all numbers that have the height of the triangle as a factor.

4. The circumference of a circle is 10\pi units. Box all numbers that have the radius of the circle as a factor.

5. Which number is not marked? _____

6. The perimeter of a rectangle is 60 units and its length is 18 units. Circle all of the numbers in this box that are multiples of the width of the rectangle.

| 120 | 135 | 164 | 1008 | 536 | 321 | 432 | 900 | 864 |

7. Explain how you decided which numbers in exercise 6 to circle.

---

On today's activity: (Circle one)  I need to know more.  I got it.

Name  Date
Get Started  Fill in the letter of the best answer.

A stem-and-leaf plot is a bit like a bar graph, except that it takes numerical data and plots the ones digits against the tens digits.  

Read 1|5 as 15.
A. How many people came to the least well-attended lecture?  
B. The person in charge of setting up chairs usually puts out 40 chairs. Why do you think this is a reasonable thing to do?

People Attending Library Lectures This Year

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5 6 8 8 9</td>
</tr>
<tr>
<td>2</td>
<td>1 1 2 3 5 5 7 8 8 8</td>
</tr>
<tr>
<td>3</td>
<td>0 0 0 1 1 1 2 2 3 4 4 5 5 5 6 6 7 8 8 8 8 9 9</td>
</tr>
<tr>
<td>4</td>
<td>0 0 0 1 2 2 3 5 8 8 9 9</td>
</tr>
<tr>
<td>5</td>
<td>1 2</td>
</tr>
</tbody>
</table>

Today's Challenge  Work with a partner and use this stem-and-leaf plot to answer the questions. The plot indicates the number of points scored by the girls' basketball team in their 18 games last season.

**Last Season's Girls' Basketball Scores**

| 3 | 5 8
| 4 | 1 2 5 7 9
| 5 | 2 2 3 5 6 9
| 6 | 0 0 1 4
| 7 | 1

1. What was the lowest score?
   - A 17  
   - B 6  
   - C 35  
   - D None of these

2. What is the range of scores?
   - A 67  
   - B 36  
   - C 57  
   - D None of these

3. What is the median score rounded to the nearest tenth?
   - A 52.5  
   - B 52.2  
   - C 52.0  
   - D None of these

4. What is the mean score rounded to the nearest tenth?
   - A 52.5  
   - B 52.0  
   - C 54.1  
   - D None of these

5. What is the mode for this data set?
   - A 60  
   - B 52  
   - C 52 and 60  
   - D None of these

6. What advice would you give to a student taking a test involving choices such as None of these?

On today's activity: (Circle one)  I need to know more.  I got it.

Name:

Date:
Today's Challenge: Fill in the table of equivalent values. Write all fractions in simplified form.

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Decimal</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>3%</td>
</tr>
<tr>
<td>2.</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>3. (\frac{5}{8})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td>(66\frac{2}{3})%</td>
</tr>
<tr>
<td>5.</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>6. (\frac{6}{5})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td>150%</td>
</tr>
<tr>
<td>8. (\frac{9}{10})</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td>20%</td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Go Further

11. Write these fractions, decimals, and percents in order from least to greatest.

<table>
<thead>
<tr>
<th>120%</th>
<th>0.65</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\frac{5}{4})</td>
<td></td>
</tr>
<tr>
<td>3%</td>
<td>0.08</td>
</tr>
<tr>
<td>(\frac{2}{3})</td>
<td></td>
</tr>
<tr>
<td>80%</td>
<td>0.125</td>
</tr>
<tr>
<td>(\frac{9}{100})</td>
<td></td>
</tr>
</tbody>
</table>

On today's activity: (Circle one)  I need to know more.  I got it.

76 Name

Date
Today's Challenge: Trigonometry

1. Measure the sides of the triangles and fill in the table. Use a calculator to find the ratios to the nearest hundredth.

<table>
<thead>
<tr>
<th>Triangle</th>
<th>ABI</th>
<th>ACH</th>
<th>ADG</th>
<th>AEF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Side</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opposite ( \angle A )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of Hypotenuse</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of Side</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjacent to ( \angle A )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ratio 1 ( \frac{\text{Opposite}}{\text{Hypotenuse}} )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ratio 2 ( \frac{\text{Opposite}}{\text{Adjacent}} )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. On a separate sheet of paper, carefully draw four right triangles arranged like the ones in exercise 1, but make the measure of \( \angle A \) equal to 30°. Fill in a table like the one in exercise 1. Be sure to write your ratios as decimals to the nearest hundredth.

On today's activity: (Circle one)  I need to know more.  I got it.

Name  Date
Go Further  Trigonometry

Work with a partner to study the data you collected in activity 77. What do you notice about those ratios? Record that and any other interesting discoveries here.

Things we discovered:


Use the ideas you discovered about right triangles and their ratios to complete exercises 1–3.

1. Even though you and your partner may have drawn different triangles for exercise 2 on page 77, how are your ratios alike?

2. If the hypotenuse of a right triangle was 34 centimeters long, how long would the side opposite the 30° angle be?

3. If you drew a big right triangle with a 40° angle in it and the side opposite the 40° angle was 15 centimeters long, about long would the hypotenuse be? Draw a diagram and explain your thinking.

On today’s activity: (Circle one)  I need to know more.  I got it.
Get Started

1. Complete the table.

<table>
<thead>
<tr>
<th>Polyhedron</th>
<th>Faces</th>
<th>Vertices</th>
<th>Edges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangular Prism</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triangular Pyramid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triangular Prism</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hexagonal Prism</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pentagonal Pyramid</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Go Further - Solve these riddles.

2. **Riddle:**
   - I have one pair of congruent parallel bases.
   - I have three pairs of congruent opposite faces, including the bases.
   - I have twelve edges that are not all congruent.
   - What is my name? ________________

3. **Riddle:**
   - I have one base.
   - I have six lateral faces that are isosceles triangles.
   - I have twelve edges.
   - What is my name? ________________

4. Now write your own riddle for a friend to solve.

   **Riddle:** ______________________________
   ______________________________
   ______________________________
   ______________________________
   ______________________________

   What is my name? ________________

   Friend’s name __________________________

On today’s activity: (Circle one) I need to know more. I got it.
Get Started

Matt and Hans were checking their answers to a test item dealing with fractions. Study the item. Without actually doing the addition, figure out who is right. Explain how you know.

\[
\begin{align*}
\text{Matt} & \quad \frac{1}{2} + \frac{2}{3} = 4\frac{1}{6} \\
\text{Hans} & \quad \frac{1}{2} + \frac{2}{3} = 4\frac{1}{4}
\end{align*}
\]

Explanation: ____________________________________________________________

Today's Challenge  ➝ Mark the letter of the correct answer. Without doing the addition, find the answer that makes sense for each exercise. Explain why each answer choice is correct or incorrect.

1. \(2\frac{2}{3} + 3\frac{3}{4}\)
   - A  \(5\frac{5}{7}\) __________________________
   - B  \(7\frac{1}{2}\) __________________________
   - C  \(6\frac{5}{12}\) __________________________
   - D  \(6\frac{3}{8}\) __________________________

2. \(3\frac{3}{8} + 6\frac{3}{4}\)
   - A  \(10\frac{1}{3}\) __________________________
   - B  \(10\frac{1}{8}\) __________________________
   - C  \(9\frac{1}{2}\) __________________________
   - D  \(10\frac{1}{6}\) __________________________

3. \(4\frac{3}{4} + 5\frac{7}{12}\)
   - A  \(10\frac{1}{3}\) __________________________
   - B  \(10\frac{1}{8}\) __________________________
   - C  \(10\frac{1}{5}\) __________________________
   - D  \(9\frac{5}{6}\) __________________________

4. What advice would you give to a student who is working on an addition with fractions problem in multiple-choice format? As part of your answer, explain why it may not always be necessary to complete the addition.

   ____________________________________________________________

On today's activity: (Circle one)  ➝ I need to know more.  ➝ I got it.

Name __________________________  Date __________________________
Today's Challenge: Find the value of each expression. Record your answers in the spaces provided.

<table>
<thead>
<tr>
<th></th>
<th>a.</th>
<th></th>
<th>b.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>8 − 4</td>
<td></td>
<td>−4 − 8</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>5 − 9</td>
<td></td>
<td>9 − 5</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>−3 − 2</td>
<td></td>
<td>2 − 3</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>−7 − 3</td>
<td></td>
<td>3 − 7</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>11 − 4</td>
<td></td>
<td>4 − 11</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>−12 − 6</td>
<td></td>
<td>6 − 12</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>−8 − 4</td>
<td></td>
<td>4 − 8</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>−7 − 12</td>
<td></td>
<td>12 − 7</td>
<td></td>
</tr>
</tbody>
</table>

Go Further: Work with a partner. Study the expressions and their values in exercises 1–8.

9. How are the expressions in parts a and b alike?

_________________________________________________________________

_________________________________________________________________

10. How are the values in parts a and b related?

_________________________________________________________________

_________________________________________________________________

On today's activity: (Circle one) I need to know more. I got it.
**Today's Challenge**  Proportionally Equal

Crime scene investigators found a shoe print 20 centimeters long.

1. To decide whether this measure might help investigators get an idea of the burglar's height, fill in this table. Express each ratio as a decimal to the nearest tenth.

<table>
<thead>
<tr>
<th>Person</th>
<th>Ann</th>
<th>Bob</th>
<th>Cyn</th>
<th>Dom</th>
<th>Eng</th>
<th>Fre</th>
<th>Gin</th>
<th>Har</th>
<th>Ian</th>
<th>Jon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height (in centimeters)</td>
<td>161</td>
<td>165</td>
<td>150</td>
<td>160</td>
<td>155</td>
<td>145</td>
<td>152</td>
<td>155</td>
<td>160</td>
<td>165</td>
</tr>
<tr>
<td>Shoe Length (in centimeters)</td>
<td>22</td>
<td>23</td>
<td>21</td>
<td>23</td>
<td>23</td>
<td>19</td>
<td>20</td>
<td>21</td>
<td>22</td>
<td>22</td>
</tr>
</tbody>
</table>

Ratio: $\frac{\text{Height}}{\text{Shoe Length}}$

2. What is the greatest possible error for these measures? ______________

3. Draw a scatterplot of the data. Describe the data in the graph.

---

**On today's activity:** (Circle one)  I need to know more.  I got it.
Go Further  Proportionally Equal

Work with a partner. Study the $\frac{\text{Height}}{\text{Shoe Length}}$ row in the table you made for activity 82. Look for relationships among the ratios for the ten people.

Things we discovered:

1. Find the mean (m) for all the ratios of Height to Shoe Length in your table, round to the nearest tenth, then draw the line $y = mx$ on this graph. $m =$ __________

2. Lay your graphs for activities 82 and 83 on top of each other and hold them up to the light. How do they compare?

3. Use the mean from exercise 1 to predict the height of a person with a shoe 25 centimeters long. Explain how you found your answer.

On today’s activity: (Circle one)  ❌  I need to know more. ✅  I got it.

Name  Date
## Today's Challenge

<table>
<thead>
<tr>
<th>Name</th>
<th>Sketch</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cube</td>
<td><img src="image" alt="Cube Sketch" /></td>
</tr>
<tr>
<td>3.</td>
<td><img src="image" alt="Triangular Prism Sketch" /></td>
</tr>
<tr>
<td>5.</td>
<td><img src="image" alt="Octahedron Sketch" /></td>
</tr>
<tr>
<td>7. Sphere</td>
<td><img src="image" alt="Sphere Sketch" /></td>
</tr>
<tr>
<td>9. Triangular Pyramid</td>
<td><img src="image" alt="Triangular Pyramid Sketch" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Sketch</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td><img src="image" alt="Triangular Prism Sketch" /></td>
</tr>
<tr>
<td>4. Cone</td>
<td><img src="image" alt="Cone Sketch" /></td>
</tr>
<tr>
<td>6. Cylinder</td>
<td><img src="image" alt="Cylinder Sketch" /></td>
</tr>
<tr>
<td>8.</td>
<td><img src="image" alt="Pyramid Sketch" /></td>
</tr>
<tr>
<td>10.</td>
<td><img src="image" alt="Cuboid Sketch" /></td>
</tr>
</tbody>
</table>

**On today's activity:** (Circle one) 为自己选择一个选项：

- I need to know more.  我需要更多了解。
- I got it.  我已经掌握了。
Get Started  An experiment consists of randomly picking one of three tiles from a bag and then flipping a coin. If the tiles are lettered A, T, and N and the coin can land heads-up or tails-up, how many different outcomes are possible? Study the tree diagram that illustrates the sample space, then write and explain an expression you could use to calculate the outcomes.

Today's Challenge  Fill in the letter of the correct answer. Use the counting principle or a tree diagram.

1. How many two-digit even numbers can be formed using the digits 0–9?
   A 50  B 36  C 45  D 90

2. Six people are running for the office of president and vice president of a local organization. If the president will be the person with the most votes and the vice president will be the person with the second most votes, how many different sets of officers could be elected?
   A 30  B 42  C 36  D 24

3. The Wheelers are planning to take a trip. They will leave from Boston and go to Wilmington, North Carolina to visit with family. They then will travel to Orlando, Florida. They will go from Orlando to Nashville, Tennessee before returning home. They are considering three different routes from Boston to Wilmington, then two different routes from Wilmington to Orlando, four different routes from Orlando to Nashville, and three different routes from Nashville back to Boston. How many different routes are possible?
   A 48  B 24  C 64  D 72

4. Three-digit numbers are to be formed by placing odd digits in the hundreds and ones places and a multiple of three in the tens place. How many numbers are possible?
   A 50  B 75  C 125  D 100

5. What advice would you give to a student who had to count the number of ways an event with multiple outcomes could follow an unrelated event with multiple outcomes?

On today's activity: (Circle one) I need to know more. I got it.

Name  Date
Today's Challenge: Fill in the missing number to make the two measurements equivalent. The first is done for you.

<table>
<thead>
<tr>
<th>Amount</th>
<th>Measurement Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. $1\frac{1}{2}$ hours</td>
<td>72 minutes</td>
</tr>
<tr>
<td>2. $3\frac{1}{2}$ feet</td>
<td></td>
</tr>
<tr>
<td>3. $1\frac{1}{4}$ dollars</td>
<td></td>
</tr>
<tr>
<td>4. $\frac{3}{4}$ of a minute</td>
<td></td>
</tr>
<tr>
<td>5. $1\frac{1}{8}$ pounds</td>
<td></td>
</tr>
<tr>
<td>6. $2\frac{1}{2}$ gallons</td>
<td></td>
</tr>
<tr>
<td>7. $1\frac{1}{5}$ yards</td>
<td></td>
</tr>
<tr>
<td>8. $\frac{3}{4}$ of a day</td>
<td></td>
</tr>
<tr>
<td>9. $3\frac{1}{2}$ dollars</td>
<td></td>
</tr>
<tr>
<td>10. $\frac{1}{4}$ kilometer</td>
<td></td>
</tr>
<tr>
<td>11. $\frac{1}{10}$ of an hour</td>
<td></td>
</tr>
</tbody>
</table>

Go Further: Fill in the table.

12. Is this fraction of a yard equivalent to a whole number of inches? Write yes or no.

<table>
<thead>
<tr>
<th>Fraction</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{1}{2}$</td>
<td>yes</td>
</tr>
<tr>
<td>$\frac{1}{3}$</td>
<td></td>
</tr>
<tr>
<td>$\frac{1}{10}$</td>
<td></td>
</tr>
<tr>
<td>$\frac{1}{4}$</td>
<td></td>
</tr>
<tr>
<td>$\frac{1}{8}$</td>
<td></td>
</tr>
<tr>
<td>$\frac{1}{9}$</td>
<td></td>
</tr>
<tr>
<td>$\frac{1}{12}$</td>
<td></td>
</tr>
</tbody>
</table>

13. What is special about the fractions for which you answered yes in exercise 12?

On today's activity: (Circle one) I need to know more. I got it.
Today's Challenge  Circle Areas

Count squares to find the approximate area of each circle.

1.  
2.  
3.  
4.  
5.  
6.  
7.  

9. What strategy did you use to account for partial squares inside a circle?

On today's activity:  (Circle one)  I need to know more.  I got it.

Name  Date
Go Further  Circle Areas

Work with a partner. Compare your results for activity 87.

1. Make a scatter plot showing your data and your partner’s data from page 87.

2. Make a table of values, then plot \( y = \pi r^2 \) on the same grid you used for exercise 1. Use 3.14 for \( \pi \).

\[
\begin{array}{c|c}
 r & y \\
\hline
 & \\
\end{array}
\]

Study your graphs. Write any interesting facts here.

**Things we discovered:**

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________

Use your discoveries to answer these questions.

3. What is the approximate radius for a circle whose area is 23 square centimeters? 

   _______

4. What is the approximate area for a circle whose radius is 7.5 centimeters? 

   _______

5. Why do you think that \( y = mx \) (from activity 83) has a graph that is a different shape than the one for \( y = \pi r^2 \) that you plotted today?

   ______________________________________________________________

**On today’s activity:** (Circle one)  I need to know more.  I got it.
Today's Challenge  Find two polygons arranged horizontally or vertically that share a common attribute associated with a number next to them. Name the two polygons and state how the number relates to the common attribute that the polygons share.

<table>
<thead>
<tr>
<th>Figures</th>
<th>Number</th>
<th>Common Attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, K</td>
<td>3</td>
<td>three sides are congruent</td>
</tr>
</tbody>
</table>

Go Further  Create your own Math Jumble. Use any four one-digit numbers and any twelve polygons. Place them in locations different than in Today's Challenge. Have a friend use your Math Jumble to find a pair of shapes that share a common attribute associated with the number next to them.

<table>
<thead>
<tr>
<th>Figures</th>
<th>Number</th>
<th>Common Attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Friend’s name _______________________

On today's activity: (Circle one)  I need to know more.  I got it.

Name __________________________ Date ________
Get Started

Here are the differences between the scores for the winning team and losing team in Super Bowls from 1988 through 2002.

Arrange the differences in order from greatest to least.

<table>
<thead>
<tr>
<th>Year</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>32</td>
</tr>
<tr>
<td>1989</td>
<td>4</td>
</tr>
<tr>
<td>1990</td>
<td>45</td>
</tr>
<tr>
<td>1991</td>
<td>1</td>
</tr>
<tr>
<td>1992</td>
<td>13</td>
</tr>
<tr>
<td>1993</td>
<td>35</td>
</tr>
<tr>
<td>1994</td>
<td>17</td>
</tr>
<tr>
<td>1995</td>
<td>23</td>
</tr>
<tr>
<td>1996</td>
<td>10</td>
</tr>
<tr>
<td>1997</td>
<td>14</td>
</tr>
<tr>
<td>1998</td>
<td>7</td>
</tr>
<tr>
<td>1999</td>
<td>15</td>
</tr>
<tr>
<td>2000</td>
<td>7</td>
</tr>
<tr>
<td>2001</td>
<td>27</td>
</tr>
<tr>
<td>2002</td>
<td>3</td>
</tr>
</tbody>
</table>

(Source: www.superbowl.com)

Today's Challenge

1. What is the range for the differences? ___________

2. What is the mean difference? Round to the nearest whole number. ___________

3. Find the first, second, and third quartiles for the data. Explain your work.

4. Make a box-and-whisker plot for the data.

5. What advice would you give a student making and using a stem-and-leaf plot on a test?

On today's activity: (Circle one) ☐ I need to know more. ☑ I got it.
**Today's Challenge**

Fill in the table by finding the mean, median, mode, or range as indicated.

<table>
<thead>
<tr>
<th>Numerical Data</th>
<th>Find the . . .</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 5, 10, and 10</td>
<td>Median =</td>
</tr>
<tr>
<td>2. 5, 5, and 10</td>
<td>Mode =</td>
</tr>
<tr>
<td>3. 5, 5, 10, and 20</td>
<td>Range =</td>
</tr>
<tr>
<td>4. 12, 15, and 21</td>
<td>Mean =</td>
</tr>
<tr>
<td>5. 12, 15, 21, and 21</td>
<td>Median =</td>
</tr>
<tr>
<td>6. 12, 15, 21, and 24</td>
<td>Mode =</td>
</tr>
<tr>
<td>7. 20, 24, and 31</td>
<td>Mean =</td>
</tr>
<tr>
<td>8. 1, 42, and 2</td>
<td>Median =</td>
</tr>
<tr>
<td>9. 1, 42, and 2</td>
<td>Mean =</td>
</tr>
<tr>
<td>10. 8, 9, 14, and 17</td>
<td>Range =</td>
</tr>
<tr>
<td>11. 8.1, 4.7, and 5.5</td>
<td>Mean =</td>
</tr>
<tr>
<td>12. 12, 16, 24, 18</td>
<td>Median =</td>
</tr>
<tr>
<td>13. 8.6, 9.3, 2.4, and 13.7</td>
<td>Range =</td>
</tr>
</tbody>
</table>

**Go Further**

Fill in the table.

<table>
<thead>
<tr>
<th>Numerical Data</th>
<th>Mean =</th>
<th>Median =</th>
<th>Range =</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. 10, 10, and 11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. 10, 10, and 1000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16. Look back at the data for exercises 14 and 15. If a data set contains a number that is very different from the rest of the data, will that number affect the mean or median more? Explain.

17. Give an example of three numbers that have a mean of 20 and a median of 25.

**On today's activity:** (Circle one)  
- I need to know more.  
- I got it.

**Name**

**Date**
Today's Challenge: Designing a Target

A grade 7 class is trying to decide which target they should use for a dart game at the school fair. Work in a small group to help them decide.

Any dart that lands inside a circle is a winner. The class cannot decide which target makes the game harder. Some argue that it is harder to land a dart in the circles on Target B than in the circle on Target A. Others disagree. Assume the dart always lands in the square as you answer exercises 1–2.

1. A. What is the area of the circle in Target A? _____________
   B. What is the area of the square that borders Target A? _____________

2. A. What is the area of each circle in Target B? _____________
   B. What is the area of all the circles in Target B? _____________
   C. What is the area of the large square that borders Target B? _____________

3. You earn a point for landing a dart inside a circle. Compare the circle-area to the target area using a percent.
   A. Target A _____________
   B. Target B _____________

4. Which target would you rather aim for? Why? Give your reason in terms of the probability that a dart that hits the target lands in a circle.

On today's activity: (Circle one) ❌ I need to know more. ✔️ I got it.

Name ________________________ Date ___________
Go Further  Designing a Target
Your data from activity 92 may have been surprising. Today, you’ll investigate further.

1. Compute the probability of winning for Targets C and D. Write your results as percents.

   Target C
   24 in. 24 in.

   Target D
   24 in. 24 in.

2. Draw a diagram of two squares with a side-length other than 24 inches. Diagram a one-circle target and a four-circle target. Which target would you rather aim for? Why? Show your work.

   _____________________________________________________________
   _____________________________________________________________
   _____________________________________________________________

Things we discovered:

3. When a circle is inscribed in a square it takes up what percent of the square? Draw a diagram to help explain your answer.

   _____________________________________________________________
   _____________________________________________________________

4. Why do you think that one-, four-, nine-, and sixteen-circle targets make games with the same level of difficulty?

   _____________________________________________________________
   _____________________________________________________________

On today’s activity: (Circle one)  I need to know more. I got it.

Name __________________________ Date __________
Go Further  Follow the directions to mark polygons in the grid. To find lines of symmetry, you might wish to trace, then fold, to be sure the overlap is perfect.

1. Cross out all figures with more than four lines of symmetry.
2. Circle all figures with no line of symmetry.
3. Star all figures with exactly one line of symmetry.
4. Box all figures with exactly four lines of symmetry.
5. Underline all figures with exactly two lines of symmetry.
6. Which figure is not marked? _________
7. Write at least three things that describe that figure.

On today’s activity: (Circle one)  •  I need to know more.  •  I got it.

Name  ____________________________  Date  ________________
Get Started

Frank and Earnest were checking their answers to a test item. Study the item. Without actually doing the multiplication, figure out who is right. Explain how you knew.

Frank
\[ \frac{3}{2} \times 2\frac{1}{3} = \frac{8}{6} \]

Ernest
\[ \frac{3}{2} \times 2\frac{1}{3} = \frac{8}{5} \]

Explanation: ____________________________________________________________

Today's Challenge 📝 Mark the letter of the best answer. Without doing the multiplication, find the answer that makes sense for each exercise. Explain why each answer choice is correct or incorrect.

1. \( 4\frac{3}{5} \times 2\frac{2}{3} \)
   A. \( 12\frac{3}{8} \)  
   B. \( 6\frac{2}{5} \)  
   C. \( 10\frac{1}{4} \)  
   D. \( 12\frac{4}{15} \)

2. \( 4\frac{1}{3} \times 5\frac{1}{6} \)
   A. \( 20\frac{1}{2} \)  
   B. \( 22\frac{7}{8} \)  
   C. \( 22\frac{1}{4} \)  
   D. \( 22\frac{3}{8} \)

3. \( 2\frac{3}{4} \times 4\frac{1}{3} \)
   A. \( 9\frac{4}{5} \)  
   B. \( 11\frac{11}{12} \)  
   C. \( 13\frac{1}{12} \)  
   D. \( 11\frac{5}{8} \)

4. What advice would you give to a student who is multiplying with fractions in a multiple-choice format? As part of your answer, explain why it may not always be necessary to complete the multiplication.
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

On today's activity: (Circle one) 🔄 I need to know more. ✔ I got it.

Name ______________________  Date ______________________

© Great Source. Permission is granted to copy this page.
Today's Challenge  Fill in the octagon by evaluating each expression. Write your differences in simplest form. As a check, add the eight values and you should have the sum in the middle of the design.

1. \(\frac{3}{4} - \frac{2}{3}\)  
2. \(\frac{5}{6} - \frac{1}{2}\)  
3. \(1\frac{1}{2} - \frac{3}{4}\)  
4. \(\frac{5}{6} - \frac{1}{4}\)  
5. \(1\frac{1}{4} - \frac{2}{3}\)  
6. \(1\frac{1}{2} - \frac{5}{6}\)  
7. \(\frac{3}{4} - \frac{1}{6}\)  
8. \(1 - \frac{5}{6}\)

Go Further

9. Write the six differences in the design in order from least to greatest. (Three of your answers should have been the same.)

10. Make your own octagon puzzle. Share it with a friend. If your answers do not agree, edit your work. Do not forget to put a check-sum in the middle.

Friend's name ____________________________

On today's activity: (Circle one) ● I need to know more. ● I got it.
Today's Challenge  Estimating to Find the Square Root

Estimate the square root. Keep track of the number of estimates you need to make before you find the square root. You may use a calculator for multiplying and dividing, but do not use the square root key for this activity.

<table>
<thead>
<tr>
<th>Number</th>
<th>First Guess</th>
<th>Second Guess</th>
<th>Third Guess</th>
<th>Fourth Guess</th>
<th>Fifth Guess</th>
<th>Square Root</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>7225</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>1156</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>1521</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>4489</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>2704</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On today's activity: (Circle one)  I need to know more.  I got it.
Go Further — Estimating to Find the Square Root

When you divide a number by its square root, the quotient is equal to the divisor. If you divide by a number that is not the square root, the size of the quotient can tell you how to change your divisor to get closer to the square root. Newton’s method for finding square roots helps you to make better estimates.

Use Newton’s method to find the square root of each number. Keep track of the estimates you make.

<table>
<thead>
<tr>
<th>Number</th>
<th>First Guess</th>
<th>Second Guess</th>
<th>Third Guess</th>
<th>Fourth Guess</th>
<th>Fifth Guess</th>
<th>Square Root</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3136</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>7744</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>3969</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>1700</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>4725</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Work with a partner. Compare your work on activity 98 with your work on activity 97.

Things we discovered:

6. Did you find Newton’s method for using estimates to find square roots more efficient than the method you used for activity 97? Why or why not?

On today’s activity: (Circle one) ❌ I need to know more. ✔️ I got it.
Get Started  For each question, write yes or no. Calculate the change using the fewest possible common coins and bills.

I bought a $14.50-item. There is a 6% sales tax. I paid with a twenty-dollar bill.

1. Is the sales tax more than $1.00? ______________

2. Does my change include a five-dollar bill? ______________

3. Does my change include more than one quarter? ______________

4. Is my change more than $4.50? ______________

A $12.60-item was marked 25% off. There is no tax. I paid with a ten-dollar bill.

5. Does my change include any dollar bills? ______________

6. Does my change include any nickels? ______________

7. Does my change include more than one quarter? ______________

8. Is my change less than $0.50? ______________

Go Further  Solve this riddle.

9. Clues: • I bought an $8.00-item that was marked 20% off.
   • There was a 5% sales tax.
   • I paid with a ten-dollar bill.
   • I received change using the fewest common coins and bills.
   • What coins and bills made up my change? ______________

10. Write your own riddle for a friend to solve.

   Clues: _____________________________________________________________________________________________

   _____________________________________________________________________________________________

   _____________________________________________________________________________________________

   _____________________________________________________________________________________________

   What coins and bills made up my change? ______________

   Friend’s name ______________

On today’s activity: (Circle one)  I need to know more.  I got it.
Get Started  Fill in the grid with the correct answer. Before beginning, decide whether the problem involves a discount or a surcharge.

Chuck received an employee’s discount of 15% off when he bought a new tennis racquet. The regular price was $68.00. What did Chuck pay for the tennis racquet?  

Today’s Challenge  Mark your answers in the appropriate grids.

1. Katie ordered a CD player that cost $90.00. She had to pay a 7% sales tax. What did she pay for the CD player?

2. Candace purchased a pair of shoes that were on sale for 25% off. The regular price was $80.00. How much did she save?

3. Amanda bought a necklace priced at $30.00. The sales tax was 6%. What was the cost of the necklace?

4. Alexa bought a shirt on sale at 20% off. The shirt was originally $22.99. If the sales tax was 6%, what did she pay for the shirt?

5. What advice would you give to someone who was trying to solve a problem involving a discount or surcharge?

On today’s activity: (Circle one)  I need to know more.  I got it.
Today's Challenge

1. Draw a five-sided polygon with two obtuse angles, two right angles, and one acute angle.
2. Draw an eight-sided polygon that has a vertical line of symmetry.
3. Draw a rectangle with four congruent sides and a perimeter of 24 units.
4. Draw a polygon with six sides and two lines of symmetry.
5. Draw a three-sided polygon with exactly two congruent sides.
6. Draw a four-sided figure. It must have two sets of congruent sides but no parallel sides.
7. Draw a circle and show the diameter.
8. Draw a cone.
10. Draw a cube.

Go Further

11. Draw triangles with the following properties.
   A. No lines of symmetry
   B. One line of symmetry
   C. Three lines of symmetry

12. Draw quadrilaterals with the following properties.
   A. No lines of symmetry
   B. One line of symmetry
   C. Two lines of symmetry
   D. Four lines of symmetry

13. What is the greatest number of lines of symmetry that a pentagon could have? Sketch your answer.

On today's activity: (Circle one) □ I need to know more. □ I got it.

Name ____________________________ Date ____________________________
Today's Challenge: Making Bar Graphs

Use each set of data to make two different bar graphs. For each set of data, start the scale for Graph A at zero and for Graph B at about half the greatest value.

1. Make your bars horizontal.

   **Games Won in a Season by Town Softball Teams**

<table>
<thead>
<tr>
<th>Team</th>
<th>Games Won</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pumas</td>
<td>24</td>
</tr>
<tr>
<td>Stallions</td>
<td>29</td>
</tr>
<tr>
<td>Elks</td>
<td>38</td>
</tr>
<tr>
<td>Bisons</td>
<td>43</td>
</tr>
<tr>
<td>Wombats</td>
<td>21</td>
</tr>
</tbody>
</table>

2. Make your bars vertical.

   **Heights of High School Basketball Players**

<table>
<thead>
<tr>
<th>Player</th>
<th>Height (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamal</td>
<td>87</td>
</tr>
<tr>
<td>Ryan</td>
<td>79</td>
</tr>
<tr>
<td>Junior</td>
<td>76</td>
</tr>
<tr>
<td>Miguel</td>
<td>77</td>
</tr>
<tr>
<td>Andy</td>
<td>86</td>
</tr>
</tbody>
</table>

On today's activity: (Circle one)  
I need to know more.  
I got it.
Go Further  Making Bar Graphs

Work with a partner. Study your graphs for activity 102. Think of ways to describe the same data on the different graphs. Write your descriptions here.

Things we discovered:


1. Why is it important to begin the scale of a graph at zero?

2. Make two accurate bar graphs for this data set. One should give an accurate impression of similarities and differences among the shops. The other should make Andy's Ice Creams look like it has far more flavors than the others.

   **Ice Cream Flavors Sold By Local Shops**

<table>
<thead>
<tr>
<th>Shop</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sally's Shoppe</td>
<td>23</td>
</tr>
<tr>
<td>Dave's Delights</td>
<td>21</td>
</tr>
<tr>
<td>Andy's Ice Creams</td>
<td>34</td>
</tr>
<tr>
<td>Tami's Treats</td>
<td>30</td>
</tr>
<tr>
<td>Darnel's Desserts</td>
<td>28</td>
</tr>
</tbody>
</table>

3. What aspects of a bar graph can be adjusted to make one quantity stand out from the others in a data set?

On today's activity: (Circle one) ☐ I need to know more. ☐ I got it.

Name ___________________________ Date ___________
Today's Challenge  Fill in the table.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>( \frac{5}{4} = \frac{10}{x} )</td>
<td>( x = )</td>
</tr>
<tr>
<td>2.</td>
<td>( \frac{13}{x} = \frac{26}{4} )</td>
<td>( x = )</td>
</tr>
<tr>
<td>3.</td>
<td>( \frac{4}{3} = \frac{8}{x} )</td>
<td>( x = )</td>
</tr>
<tr>
<td>4.</td>
<td>( \frac{4}{8} = \frac{2}{x} )</td>
<td>( x = )</td>
</tr>
<tr>
<td>5.</td>
<td>( \frac{6}{9} = \frac{8}{x} )</td>
<td>( x = )</td>
</tr>
<tr>
<td>6.</td>
<td>( \frac{x}{36} = \frac{2}{8} )</td>
<td>( x = )</td>
</tr>
<tr>
<td>7.</td>
<td>( \frac{9}{6} = \frac{x}{4} )</td>
<td>( x = )</td>
</tr>
<tr>
<td>8.</td>
<td>( \frac{x}{6} = \frac{5}{10} )</td>
<td>( x = )</td>
</tr>
<tr>
<td>9.</td>
<td>( \frac{14}{x} = \frac{8}{4} )</td>
<td>( x = )</td>
</tr>
<tr>
<td>10.</td>
<td>( \frac{2}{12} = \frac{x}{18} )</td>
<td>( x = )</td>
</tr>
<tr>
<td>11.</td>
<td>( \frac{x}{12} = \frac{2}{3} )</td>
<td>( x = )</td>
</tr>
<tr>
<td>12.</td>
<td>( \frac{42}{12} = \frac{x}{2} )</td>
<td>( x = )</td>
</tr>
<tr>
<td>13.</td>
<td>( \frac{x}{3} = \frac{16}{4} )</td>
<td>( x = )</td>
</tr>
<tr>
<td>14.</td>
<td>( \frac{5}{15} = \frac{3}{x} )</td>
<td>( x = )</td>
</tr>
<tr>
<td>15.</td>
<td>( \frac{x}{7} = \frac{6}{21} )</td>
<td>( x = )</td>
</tr>
<tr>
<td>16.</td>
<td>( \frac{5}{x} = \frac{20}{16} )</td>
<td>( x = )</td>
</tr>
</tbody>
</table>

On today's activity: (Circle one)    I need to know more.    I got it.

Name:  Date:
Get Started  Mark the letter of the correct answer.

Which is the best estimate for the value of \(2\frac{1}{2} \div \frac{1}{8}\)? Explain why each choice is or is not a good estimate.

A. \(3 \times \frac{1}{8} = \frac{3}{8}\)  
B. \(3 \div 8 = \frac{3}{8}\)  
C. \(2 \times 8 = 16\)  
D. \(2 \div 8 = \frac{1}{4}\)

Today’s Challenge  Mark the letter of the correct answer. Explain how you eliminated at least two incorrect answer choices.

1. \(6\frac{1}{3} \div \frac{1}{4}\)  
   A. \(15\frac{2}{3}\)  
   B. \(25\frac{1}{3}\)  
   C. \(2\frac{5}{12}\)  
   D. \(1\frac{2}{3}\)

2. \(9\frac{1}{2} \div \frac{3}{4}\)  
   A. \(15\frac{1}{3}\)  
   B. \(12\frac{2}{3}\)  
   C. \(4\frac{3}{4}\)  
   D. \(6\frac{1}{3}\)

3. \(7\frac{2}{3} \div \frac{2}{3}\)  
   A. \(4\frac{1}{2}\)  
   B. \(18\frac{2}{3}\)  
   C. \(11\frac{1}{2}\)  
   D. \(6\frac{2}{3}\)

4. \(4\frac{3}{8} \div \frac{7}{10}\)  
   A. \(3\frac{2}{5}\)  
   B. \(15\frac{1}{3}\)  
   C. \(2\frac{1}{5}\)  
   D. \(6\frac{1}{4}\)

5. What advice would you give about estimating when dividing mixed numbers by fractions less than one?

On today’s activity: (Circle one) I need to know more. I got it.

Name  
Date
Today's Challenge - Use mental math to fill in the table.

<table>
<thead>
<tr>
<th></th>
<th>10%</th>
<th>25%</th>
<th>33 1/3%</th>
<th>50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>48</td>
<td></td>
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<tr>
<td>4.</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5.</td>
<td>36</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Go Further - Explain your mental-math strategy for solving exercises 6–9.

6. Use the work you’ve already done to find 5% of each number in exercises 1–5.

7. Use the work you’ve already done to find 15% of each number in exercises 1–5.

8. Use the work you’ve already done to find 66 2/3% of each number in exercises 1–5.

9. Use the work you’ve already done to find 75% of each number in exercises 1–5.

On today’s activity: (Circle one) ☐ I need to know more. ☐ I got it.
Today's Challenge: Mean vs. Median

Both the mean and the median can be used to show the typical number in a set of data. For these exercises, round to the nearest tenth.

1. Jan makes knotted bracelets to sell at the swap meet. Here is her record of the bracelets made over the last seven weeks.

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
<th>Week 6</th>
<th>Week 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>36</td>
<td>54</td>
<td>51</td>
<td>59</td>
<td>74</td>
<td>42</td>
<td>58</td>
</tr>
</tbody>
</table>

A. Find the mean number of bracelets per week. _______

B. Find the median number of bracelets per week. _______

C. How would the mean and median change if she had produced 148 instead of 74 bracelets in week five?

D. How would the mean and median change if she had produced 37 instead of 74 bracelets in week five?

2. Orion harvests tomatoes in his parents' garden. Here is record of the seven-week harvest.

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
<th>Week 6</th>
<th>Week 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>66</td>
<td>83</td>
<td>65</td>
<td>59</td>
<td>96</td>
<td>29</td>
<td>45</td>
</tr>
</tbody>
</table>

A. Find the mean number of tomatoes per week. _______

B. Find the median number of tomatoes per week. _______

C. How would the mean and median change if he had harvested 192 instead of 96 tomatoes in week five?

D. How would the mean and median change if he had harvested 48 instead of 96 tomatoes in week five?

On today's activity: (Circle one)  I need to know more.  I got it.
Go Further  Mean vs. Median

Use this data set for exercises 1–4. Round your answers to the nearest cent.
Prices of energy bars: $0.45, $0.54, $1.50, $0.89, $0.79, $0.85

1. What is the mean price? ________  2. What is the median price? ________

3. Halve the value of the most expensive energy bar.
   A. What is the mean price now? ________
   B. What is the median price now? ________

4. Double the value of the most expensive energy bar.
   A. What is the mean price now? ________
   B. What is the median price now? ________

Study your results for page 107 and for exercises 1–4 on this page before completing exercises 5–7.

Things we discovered:

5. Which changes most when one data value is greatly increased or decreased, mean or median? Explain.

______________________________________________________________________________
______________________________________________________________________________

6. How could you change some of the values in a data set and still not change the median?

______________________________________________________________________________
______________________________________________________________________________

7. How could you change some of the values in a data set and still not change the mean?

______________________________________________________________________________
______________________________________________________________________________

On today's activity: (Circle one) ☐ I need to know more. ☑ I got it.

Name ☐ Date
Today's Challenge  
Find strings of four digits that can be used as the numerators and denominators of two fractions that you will add or subtract. The sums or differences must be between zero and one. Write each complete sum or difference below. Simplify all answers.

<table>
<thead>
<tr>
<th>Sum</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>

Go Further  
Change the operation. Rewrite each of the addition examples above as multiplication and find the product. Rewrite each of the subtraction examples above as division and find the quotient. There is no restriction on the size of the product or quotient. Simplify all answers.

<table>
<thead>
<tr>
<th>Product</th>
<th>Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

On today's activity: (Circle one)  
I need to know more.  
I got it.

Name  Date
Get Started  Show your work. Complicated problems need careful attention. Write each fact in this problem as an equation, then substitute values into one or more equations to get your final result. Be sure to answer the question.

Denyse ordered a video game from an Internet site. She had to pay 15% of the price of the game to cover the shipping and handling. The total cost was $88.48. What was the shipping and handling charge?

Today's Challenge  Show your work. Be sure to answer the question.

1. Dean's family went out to a restaurant for a meal. His parents tipped the server 15% of the price of their meal. With the tip, the total bill was $84.00. How much of a tip did the waiter get?

2. Juanita bought a CD that cost her $18.00. This price includes a sales tax of 6%. What was the price of the CD?

3. Sally was late making a payment on her new scooter. The bank charged her 5% of the payment due as a late fee. The total she owed that bank, late fee included was $47.25. What was the late fee?

4. The city where Steve lives charges 8% sales tax on all purchases. Steve bought a shirt that had a total cost of $27.53, tax included. What was the price of the shirt?

5. What advice would you give to someone solving multi-step word problems on a test?

On today's activity: (Circle one)  I need to know more.  I got it.

Name  Date
**Today's Challenge**  Use mental math to compute the answer to each of the problems in Column A. Find the matching answer in Column B. Write the letter of your solution in the space provided.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is the sum of 4.2 and 0.66?</td>
<td>a. 3.43</td>
</tr>
<tr>
<td>2. What is the product of 0.6 and 0.7?</td>
<td>b. 0.08</td>
</tr>
<tr>
<td>3. What is the difference of 6.52 and 3.4?</td>
<td>c. 2.08</td>
</tr>
<tr>
<td>4. What is the sum of 1.3 and 2.13?</td>
<td>d. 0.42</td>
</tr>
<tr>
<td>5. What is the quotient of 0.64 and 0.8?</td>
<td>e. 3.95</td>
</tr>
<tr>
<td>6. What is the difference of 9.2 and 9.12?</td>
<td>f. 3.12</td>
</tr>
<tr>
<td>7. What is the product of 2.43 and 0.2?</td>
<td>g. 4.86</td>
</tr>
<tr>
<td>8. What is the sum of 0.54 and 3.41?</td>
<td>h. 0.8</td>
</tr>
<tr>
<td>9. What is the quotient of 0.624 and 0.3?</td>
<td>i. 2.8</td>
</tr>
<tr>
<td>10. What is the difference of 5 and 2.2?</td>
<td>j. 0.486</td>
</tr>
</tbody>
</table>

**Go Further**  Use the first fact to evaluate the related expressions in each group.

11. \( 26.4 \div 200 = 0.132 \)
   
   \[
   \begin{align*}
   26.4 \div 20 & = \underline{1.02} \\
   26.4 \div 2 & = \underline{13.2} \\
   26.4 \div 0.2 & = \underline{132} \\
   26.4 \div 0.02 & = \underline{1320} \\
   \end{align*}
   \]

12. \( 13.8 \times 400 = 5520 \)
   
   \[
   \begin{align*}
   13.8 \times 40 & = \underline{552} \\
   13.8 \times 4 & = \underline{55.2} \\
   13.8 \times 0.4 & = \underline{5.52} \\
   13.8 \times 0.04 & = \underline{0.552} \\
   \end{align*}
   \]

**On today's activity:** (Circle one)  I need to know more.  I got it.

Name  

Date  

111
Today's Challenge: Segments on a Geoboard

1. Use the diagrams any way you like to help you count the different lengths of line segments that can be shown on a five-peg by five-peg geoboard. Each segment must start and end with a dot. Keep track of your results in the table.

Possible Line Segment Lengths on a Five-Peg By Five-Peg Geoboard

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</tbody>
</table>

On today's activity: (Circle one) □ I need to know more. □ I got it.

Name
Date
Go Further  Segments on a Geoboard

Work with a partner. Study your work on activity 112 to complete exercises 1–2.

Things we discovered:

1. List the segment lengths (in units) that may be shown on a five-peg by five-peg geoboard. Explain how you know that you have found all horizontal, vertical, and oblique segment-lengths.

   __________________________________________

   __________________________________________

   __________________________________________

2. Explain how you used the Pythagorean Theorem in your search for the segments.

   __________________________________________

Use what you have already done to complete exercises 3–4.

3. Find the possible segment lengths (in units) on a three-peg by three-peg geoboard.

   __________________________________________

   __________________________________________

4. Find the possible segment lengths (in units) on a six-peg by six-peg geoboard.

   __________________________________________

   __________________________________________

   __________________________________________

   __________________________________________

On today's activity: (Circle one)  I need to know more.  I got it.

Name

Date
Go Further Follow the directions to mark points in the plane. Some will be marked more than once.

1. Cross out all points on the x-axis.
2. Star all points with $x = y$.
3. Circle all points with $y = -x$.
4. Box all points with $y = 3$.
5. Underline all points with $y - x = 3$.

6. Which point is not marked? ________________

7. Mark each point on this grid using these four rules.

   Rule 1: the x-coordinates are $-8, -7, -6, \ldots, 1, 2, \text{ and } 3$ and the y-coordinate is 2.

   Rule 2: the x-coordinate is 3 and the y-coordinates are 2, 3, 4, 5, 6, and 7.

   Rule 3: the x-coordinates are 3, 2, 1, $\ldots$, $-6, -7, -8$ and the y-coordinate is 7.

   Rule 4: the x-coordinate is $-8$ and the y-coordinates are 7, 6, 5, 4, 3, and 2.

8. Connect your points for exercise 7 in the order in which you marked them. What geometric figure have you drawn? ________________

On today's activity: (Circle one) I need to know more. * I got it.
Get Started  Fill in the letter of the correct answer. Draw a diagram to the right of the answer choices, then solve the problem.

Triangle $ABC$ has a $90^\circ$ angle at vertex $B$, $AB = 9$ centimeters, $BC = 12$ centimeters. Find the length of $AC$.

A  225 cm  B  about 112.5 cm
C  15 cm  D  21 cm

Today's Challenge  Fill in the letter of the correct answer. Draw a useful diagram for each problem.

1. Triangle $WHO$ has a $90^\circ$ angle at vertex $H$, $OH = 12$ inches, $WH = 5$ inches. Find the length of $WO$.

A  169 in.  B  about 64.5 in.
C  13 in.  D  17 in.

2. Triangle $CRY$ has a right angle at vertex $R$, $CR = 15$ feet, $RY = 8$ feet. Find the length of $CY$.

A  17 feet  B  23 feet
C  about 144.5 feet  D  about 264.5 feet

3. Triangle $SUV$ has a right angle at vertex $U$, $SV = 10$ units, $VU = 6$ units. Find the length of $SU$.

A  $\sqrt{136}$ units  B  8 units
C  4 units  D  32 units

4. In triangle $VCR$, $\angle V$ measures $90^\circ$, $CR = 16$ yards, $CV = 9$ yards. Find the length of $VR$.

A  7 yards  B  25 yards
C  $\sqrt{337}$ yards  D  $\sqrt{175}$ yards

5. What advice would you give to someone who was trying solve for missing side lengths in right triangles on a test?

On today's activity: (Circle one)  I need to know more.  I got it.

Name  Date
**Today's Challenge**  
Fill in this table by multiplying the fraction at the left of the row by the fraction at the top of the column. Write your product in simplest form.

<table>
<thead>
<tr>
<th>×</th>
<th>(\frac{1}{2})</th>
<th>(\frac{2}{3})</th>
<th>(\frac{3}{4})</th>
<th>(\frac{5}{6})</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>(\frac{1}{3})</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td>(\frac{2}{3})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td>(\frac{5}{6})</td>
<td></td>
</tr>
</tbody>
</table>

**Go Further**

4. What is the least common denominator for all of the products found in the table?

5. Write the products in the table in order from least to greatest.

---

**On today's activity:** (Circle one)  
- I need to know more.  
- I got it.
Today's Challenge: Squares on a Geoboard

1. Find all the different sizes of squares that are possible on a five-peg by five-peg geoboard. There may be more than you think. Make sketches of your squares and use the table to keep a record of the sizes you find.

Possible Square Sizes on a Five-Peg By Five-Peg Geoboard

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tbody>
</table>

On today's activity: (Circle one)  I need to know more.  I got it.
Go Further  **Squares on a Geoboard**

Work with a partner. Analyze your work on activity 118. Refer back to activities 112–113 for clues to the possible side-lengths for your squares.

1. Diagram the sizes of squares that can be shown on a five-peg by five-peg geoboard. Then study your work on activities 117 and 118.

![Diagram of squares on a geoboard](image)

**Things we discovered:**

2. List the square-sizes that can be shown on a five-peg by five-peg geoboard.

   ______________________________________

   ______________________________________

3. Which squares were difficult for you to find? Why?

   ______________________________________

   ______________________________________

4. Find the area of each square you named in exercise 2. List the areas in order from least to greatest.

   ______________________________________

   ______________________________________

**On today's activity:** (Circle one)  ☐ I need to know more. ☑ I got it.
Get Started

1. Label the number line with rational numbers in simplest form.

-2 \quad | \quad | \quad | \quad | \quad | \quad | 1

Go Further Use your number line. Name a rational number in simplest form that answers each riddle.

2. I am greater than \(-1\frac{1}{4}\) but less than \(-\frac{1}{2}\) and my numerator is three.
   Who am I? ______

3. I am exactly halfway between \(-1\frac{1}{2}\) and \(-1\frac{1}{4}\).
   Who am I? ______

4. I am exactly halfway between \(-2\frac{3}{4}\) and \(-1\).
   Who am I? ______

5. Fill in the blanks with rational numbers to make a riddle.
   **Clues:**
   - I am greater than ______.
   - I am less than ______.
   - My numerator is ______.
   Who am I? ______

6. Now write your own riddle for a friend to solve.
   **Clues:**
   ____________________________
   ____________________________
   ____________________________

   Who am I? ______

   Friend’s name ____________________________

On today’s activity: (Circle one) I need to know more. I got it.

Name ____________________________  Date ____________________________
Get Started  Study the constructed response.

Problem: Miles Stone noticed that the price of movie tickets in his town in 2002 were about 25% higher than in 2001. However, when a new theater was built in 2003, prices dropped about 25%. Illustrate and explain how the 2003 price compared to the 2001 price.

Solution:
First, pretend the 2001 price was $1.00. Find the 2002 price.

2001 price = 100%
2002 price = 2001 price + 25% of 2001 price
= 100% + 25% of 2001 price
= 1.25 × 1.00
= 1.25

Next, find the 2003 price.

2003 price = 2002 price − 25% of 2002 price
= 100% − 25% of 2002 price
= 0.75 × 1.25
= 0.9375

Round to reflect the fact that you are dealing with money.

0.9375 ≈ 0.94

Compare 2003 price to 2001 price.

$0.94 = what percent of $1.00?
= 94% of $1.00

Finally, write a clear, complete answer to the original question.
The price of the 2003 movie was about 94% of the 2001 price.

Today's Challenge  On a separate sheet of paper, write a constructed response.

1. Problem: The price of the cable television service to Miles' home has increased twice in the past two years. It started at $30.99, then rose 10%, then rose 5%. What was the percent increase in the cost of cable service over the two years?

2. What advice would you give to a student preparing for a constructed response test involving percent increase and decrease?

On today's activity: (Circle one)  I need to know more.  I got it.
Today's Challenge: Which is greater? By how much?

<table>
<thead>
<tr>
<th></th>
<th>Which is Greater</th>
<th>How Much Greater</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Which is greater, (\frac{1}{3}) of 303 or (\frac{1}{4}) of 408?</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Which is greater, (\frac{1}{5}) of 350 or (\frac{1}{4}) of 360?</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Which is greater (\frac{1}{6}) of 126 or (\frac{2}{3}) of 36?</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Which is greater, (\frac{3}{4}) of 6400 or (\frac{5}{9}) of 8100?</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Which is greater, (\frac{2}{5}) of 3600 or (\frac{3}{8}) of 5600?</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Which is greater, (\frac{5}{8}) of 9600 or (\frac{7}{8}) of 7200?</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Which is greater, (\frac{1}{8}) of 9600 or (\frac{3}{7}) of 3500?</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Which is greater, (\frac{4}{5}) of 350 or (\frac{4}{7}) of 490?</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Which is greater, (\frac{2}{5}) of 120 or (\frac{2}{3}) of 75?</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Which is greater, (\frac{2}{3}) of 3450 or (\frac{1}{3}) of 7200?</td>
<td></td>
</tr>
</tbody>
</table>

Go Further

11. If \(\frac{3}{4}\) of some number is 90, how can you find \(\frac{2}{3}\) of the same number?

   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

12. Write three of your own Which is Greater problems. For one of them, make sure the answer is neither. Ask a friend to solve your problems.

   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

Friend’s name ____________________________

On today’s activity: (Circle one)  I need to know more.  I got it.
**Today's Challenge**  Roll It Again Sam

1. Work with a partner. Take turns rolling a 1–6 number cube following these rules.
   - If your first name is first in alphabetical order, you are Player A and your partner is Player B.
   - Player A rolls the cube.
   - On a separate sheet of paper, Player B tallies the roll-number and records the number that lands face up.
   - Player A rolls again.
   - Player B records the roll-number then records the face-up number only if it has not already been recorded.
   - Keep rolling and recording until the numbers 1–6 have all landed face up at least once.
   - Record a tally in the table in the space next to the number of rolls required for all six numbers to land face up.
   - Switch places and repeat until you have each had three turns.

**Example:**
Results for one turn.
Roll number: \[ H H T H H H \]
Face-up number:

<table>
<thead>
<tr>
<th>Number of Rolls To Get 1–6</th>
<th>Tally</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
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<tr>
<td>9</td>
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<td>10</td>
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<td>11</td>
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<td>12</td>
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<td>13</td>
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<td>14</td>
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<td>15</td>
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<td>16</td>
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<td>17</td>
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<td>18</td>
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<td>19</td>
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<td>20</td>
<td></td>
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<tr>
<td>21</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

**On today's activity:** (Circle one)  
I need to know more.  
I got it.
Go Further  Roll It Again Sam

Work with a partner. Study your data and the class data for activity 122. Write any interesting patterns or facts here.

Things we discovered: ____________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________

For exercises 1–7, use the data from activity 122.

1. Find the mean number of rolls required to get all six numbers. _______

2. What is the median for the data set? _______

3. What is the mode for the data set? _______

4. What is the range for this set of data? _______

5. If all of the outcomes of an event are equally likely, as in this experiment, then the experimental probability of an event is the number of successes divided by the number of outcomes. What is the experimental probability of rolling all six numbers in exactly six rolls? _______

6. What is the experimental probability of rolling all six numbers in 10 or fewer rolls? _______

7. What is the experimental probability of rolling all six numbers in 15 or fewer rolls? _______

On today's activity: (Circle one)  I need to know more.  I got it.

Name ___________________________ Date ____________
Today's Challenge: Find the value of each expression.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>$5 + -8(4) = $</td>
</tr>
<tr>
<td>2.</td>
<td>$\frac{-8}{4} - 6 = $</td>
</tr>
<tr>
<td>3.</td>
<td>$-10 - 4(-3) = $</td>
</tr>
<tr>
<td>4.</td>
<td>$3 + -12 + -4 = $</td>
</tr>
<tr>
<td>5.</td>
<td>$7 + \frac{-9}{3} = $</td>
</tr>
<tr>
<td>6.</td>
<td>$-3(3^2) = $</td>
</tr>
<tr>
<td>7.</td>
<td>$8 - (-3 + -1) = $</td>
</tr>
<tr>
<td>8.</td>
<td>$4 + -5 \times 2 = $</td>
</tr>
<tr>
<td>9.</td>
<td>$2^4 + -6 - 10 = $</td>
</tr>
<tr>
<td>10.</td>
<td>$-6 - 4 + 16 = $</td>
</tr>
<tr>
<td>11.</td>
<td>$-8 + 4 + 5 = $</td>
</tr>
<tr>
<td>12.</td>
<td>$(6 + -6) ÷ 4 = $</td>
</tr>
<tr>
<td>13.</td>
<td>$\frac{2}{3}(3 - 15) = $</td>
</tr>
<tr>
<td>14.</td>
<td>$10 \times -2 ÷ 4 = $</td>
</tr>
<tr>
<td>15.</td>
<td>$8 \times -2 ÷ -4 = $</td>
</tr>
<tr>
<td>16.</td>
<td>$-7 + 3 + 7 = $</td>
</tr>
<tr>
<td>17.</td>
<td>$\frac{-4 + -6}{-5} = $</td>
</tr>
<tr>
<td>18.</td>
<td>$\frac{-2 - 10}{2} = $</td>
</tr>
<tr>
<td>19.</td>
<td>$(-1)^3 - 2^2 = $</td>
</tr>
<tr>
<td>20.</td>
<td>$2^3 - -4 = $</td>
</tr>
</tbody>
</table>

On today's activity: (Circle one) I need to know more. I got it.
Get Started  Mark the letter of the correct answer.
There are six finalists competing for one of two free trips to Australia. Their names are Katia (K), Mourad (M), Sophie (S), Herman (H), Natasha (N), and Roberto (R). The two winners are to be selected randomly. On a separate sheet of paper, make a sample space showing all possible groups of two people.

Today’s Challenge  Mark the letter of the correct answer.
1. How many different groups of two people can be made from a group of six people?
   A. 12  B. 14  C. 15  D. 16

2. What is the probability that Sophie will win one of the trips?
   A. \( \frac{1}{15} \)  B. \( \frac{1}{6} \)  C. \( \frac{1}{2} \)  D. \( \frac{1}{3} \)

3. What is the probability that either Mourad or Herman will win a free trip?
   A. \( \frac{3}{5} \)  B. \( \frac{2}{3} \)  C. \( \frac{2}{15} \)  D. \( \frac{1}{3} \)

4. What is the probability that Natasha will not win a free trip?
   A. \( \frac{4}{15} \)  B. \( \frac{5}{6} \)  C. \( \frac{1}{2} \)  D. \( \frac{2}{3} \)

For exercises 5–8, two people are to be randomly selected from a group of four people.

5. How many different groups of two people can be made from a group of four people?
   A. 2  B. 4  C. 6  D. 12

6. What is the probability that a given person will be selected?
   A. \( \frac{1}{4} \)  B. \( \frac{1}{2} \)  C. \( \frac{1}{3} \)  D. \( \frac{2}{3} \)

7. In the group of four, two people are best of friends, what is the probability they will both be selected?
   A. \( \frac{1}{4} \)  B. \( \frac{1}{2} \)  C. \( \frac{1}{6} \)  D. \( \frac{1}{3} \)

8. What is the probability that at least one of the two friends will be selected?
   A. \( \frac{3}{4} \)  B. \( \frac{1}{3} \)  C. \( \frac{2}{3} \)  D. \( \frac{5}{6} \)

9. What advice would you give to a student taking a test involving combinations and probability?

On today’s activity: (Circle one)  I need to know more.  I got it.

Name  Date
**Today's Challenge**  
Find the perimeter and area of each figure.

1. 
   - **Perimeter (P)**:  
   - **Area (A)**: 

2. 
   - **Perimeter (P)**:  
   - **Area (A)**: 

3. 
   - **Perimeter (P)**:  
   - **Area (A)**: 

4. 
   - **Perimeter (P)**:  
   - **Area (A)**: 

5. 
   - **Perimeter (P)**:  
   - **Area (A)**: 

6. 
   - **Perimeter (P)**:  
   - **Area (A)**: 

**Go Further**

7. The perimeter of a rectangle is 20 feet. What are the possible whole-number dimensions for the rectangle? Record your answers in the table.

<table>
<thead>
<tr>
<th>Perimeter</th>
<th>Length (ft)</th>
<th>Width (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

8. Label the last column of the table *Area (sq. ft)* and compute the area of each rectangle you found for exercise 7.

9. What is special about the rectangle with greatest area?

---

**On today's activity:** (Circle one)  
- I need to know more.  
- I got it.
Today's Challenge: Square Patterns

The large square is considered Stage Zero. Work with a partner.

1. Measure each side and divide it into thirds. Connect the trisection points, making a new set of nine squares and shade in the middle square. This new set of nine squares is Stage One. Construct Stages two and three by taking the unshaded squares, dividing each into nine new squares, and shading in the center square. Record in the table the number of shaded and unshaded squares in each stage.

2. The area of the large square is one. Fill in the table.

<table>
<thead>
<tr>
<th>Stage</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unshaded Squares</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shaded Squares</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area of Unshaded</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>(in square units)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area of Shaded</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Squares (in square units)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On today's activity: (Circle one) I need to know more. I got it.

Name

Date
Go Further  Square Patterns

Work with a partner. Look for patterns in the data you generated in Stages Zero through Three in activity 127. Describe the patterns you found for the shaded and unshaded squares. You may want to use exponential notation to help describe your patterns.

Things we discovered: __________________________________________

_____________________________________________________________

_____________________________________________________________

_____________________________________________________________

_____________________________________________________________

1. Write a formula or explain a way to find the number of unshaded squares there are in Stage $n$ of the Square Pattern. __________________________

2. Use your formula or method from exercise 1 to find the number of unshaded squares in Stage Ten of the Square Pattern. __________________________

3. Write a formula or a method to find the area of the unshaded squares in Stage $n$ of the Square Pattern. __________________________

4. Use your formula or method from exercise 3 to find the area of the unshaded squares in Stage Ten of the Square Pattern. __________________________

On today's activity: (Circle one) ❌ I need to know more. ✔ I got it.
Today’s Challenge  Look for three-digit numbers that have whole-number products when multiplied by 25%, 33\(\frac{1}{3}\)%, or 50%. Write the facts you find in word form and using math symbols as shown in the example.

Example: 50% of 264 is 132; \(\frac{1}{2} \times 264 = 132\)

25% of ____ is ____; \(\frac{1}{4} \times ____ = ____\)
25% of ____ is ____; \(\frac{1}{4} \times ____ = ____\)
25% of ____ is ____; \(\frac{1}{4} \times ____ = ____\)
33\(\frac{1}{3}\)% of ____ is ____; \(\frac{1}{3} \times ____ = ____\)
33\(\frac{1}{3}\)% of ____ is ____; \(\frac{1}{3} \times ____ = ____\)
33\(\frac{1}{3}\)% of ____ is ____; \(\frac{1}{3} \times ____ = ____\)
50% of ____ is ____; \(\frac{1}{2} \times ____ = ____\)
50% of ____ is ____; \(\frac{1}{2} \times ____ = ____\)
50% of ____ is ____; \(\frac{1}{2} \times ____ = ____\)

Go Further  Create your own Math Jumble. Include three-digit numbers that have whole-number products when multiplied by 25%, 33\(\frac{1}{3}\)%, or 50%. Include two of each type. Have a friend use your Math Jumble to find the six facts you have made.

Have your friend write the facts below.

1. 25% of ____ is ____; \(\frac{1}{4} \times ____ = ____\)
2. 25% of ____ is ____; \(\frac{1}{4} \times ____ = ____\)
3. 33\(\frac{1}{3}\)% of ____ is ____; \(\frac{1}{3} \times ____ = ____\)
4. 33\(\frac{1}{3}\)% of ____ is ____; \(\frac{1}{3} \times ____ = ____\)
5. 50% of ____ is ____; \(\frac{1}{2} \times ____ = ____\)
6. 50% of ____ is ____; \(\frac{1}{2} \times ____ = ____\)

Friend’s name ____________________________

On today’s activity: (Circle one)  I need to know more.  I got it.

Name ____________________________ Date __________
Get Started  Show your answer in the answer grid.

Find the number of square centimeters in the surface area of the cylinder. Use 3.14 for π.

Today's Challenge  Find the indicated measure. Round all decimals to the nearest tenth. Show your answer in the answer grid.

1.  
   \[ SA = \quad \text{sq. in.} \]

2.  
   \[ SA = \quad \text{sq. m} \]

3.  
   \[ h = \quad \text{ft} \]

4.  
   \[ SA = \quad \text{sq. in.} \]

5. What advice would you give to a student trying to measures of solids?

   

   

On today's activity: (Circle one) I need to know more. I got it.
Today's Challenge: Use mental math to fill in the table. If your calculations are correct, the sum of your answers will be $100!

<table>
<thead>
<tr>
<th>Percent</th>
<th>Amount</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 5%</td>
<td>$36.80</td>
<td></td>
</tr>
<tr>
<td>2. 50%</td>
<td>$38.60</td>
<td></td>
</tr>
<tr>
<td>3. 25%</td>
<td>$28.40</td>
<td></td>
</tr>
<tr>
<td>4. $3\frac{1}{3}$%</td>
<td>$6.30</td>
<td></td>
</tr>
<tr>
<td>5. 10%</td>
<td>$42.50</td>
<td></td>
</tr>
<tr>
<td>6. 25%</td>
<td>$48.80</td>
<td></td>
</tr>
<tr>
<td>7. $3\frac{3}{3}$%</td>
<td>$39.90</td>
<td></td>
</tr>
<tr>
<td>8. 15%</td>
<td>$156.00</td>
<td></td>
</tr>
<tr>
<td>9. 20%</td>
<td>$75.00</td>
<td></td>
</tr>
<tr>
<td>10. 10%</td>
<td>$15.10</td>
<td></td>
</tr>
</tbody>
</table>

$100.00

Go Further

11. The service at a restaurant was particularly good and you wish to leave about a 20% tip. Your dinner bill is $48.35. Explain how to approximate a 20% tip.

   ____________________________
   ____________________________
   ____________________________

12. Make your own set of five percent problems. The sum of your answers should be $200. Give them to a friend to solve. If your answers disagree, edit your work.

   Friend's name ____________________________

<table>
<thead>
<tr>
<th>Percent</th>
<th>Amount</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$200.00

On today's activity: (Circle one) I need to know more. I got it.
Today’s Challenge  Square Patterns

1. Study the diagram of the first three figures in the pattern. Draw and label diagrams for figures 4–6. Use colored squares to construct them if it helps.

2. Fill in the table.

<table>
<thead>
<tr>
<th>Square Figure Number</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Squares</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On today’s activity: (Circle one)  ☐ I need to know more.  ☐ I got it.
Go Further  Square Patterns

Work with a partner to study the table you created for activity 132. Compare the Figure number with the number of squares used to make that figure and look at how the number of squares varies from one figure to the next. Write your discoveries here.

Things we discovered: ____________________________________________

________________________________________________________________
________________________________________________________________
________________________________________________________________

1. If you wanted to find out how many squares were in Figure 17, what would you do?

________________________________________________________________
________________________________________________________________

2. What geometric shape is at the lower left of each figure? __________________

3. Study the two arms on each figure. Compare the lengths of those arms to the Figure number.

________________________________________________________________
________________________________________________________________

4. Write a formula or explain how to find out how many squares are in Figure n.

________________________________________________________________
________________________________________________________________

5. A figure has 143 squares in it. What is its figure number? Explain how you found the answer.

________________________________________________________________
________________________________________________________________

On today's activity:  (Circle one)  I need to know more.  I got it.

Name ___________________________ Date ___________
Go Further  Follow the directions to mark numbers in the grid. Some numbers will be marked more than once.

1. Cross out all numbers that are greater than the number of days in April.

2. Star all numbers that are less than the number of ounces in $\frac{3}{4}$ of a pound.

3. Circle all numbers that are a number of inches between $1\frac{1}{2}$ and $2\frac{1}{2}$ feet.

4. Box all numbers that are divisible by the number of hours in $\frac{1}{8}$ of a day.

5. Underline all numbers that are less than or equal to the number of quarts in four gallons.

6. Which number is not marked? ________

7. Create your own “Fantastic Finalist” activity for a friend to solve.

- ____________  all numbers that are ________________.
- ____________  all numbers that are ________________.
- ____________  all numbers that are ________________.
- ____________  all numbers that are ________________.
- ____________  all numbers that are ________________.
- ____________  all numbers that are ________________.
- ____________  all numbers that are ________________.

Which number is not marked? ______

Friend’s name __________________________

On today’s activity: (Circle one)  I need to know more.  I got it.
Get Started  Fill in the letter of the correct answer. Use the graph and estimate to choose reasonable answers to the questions. Explain your thinking about each answer choice.

There are 192 flags of independent countries in the world. If there is only one country that has one color in its flag, how many countries have more than five colors in their flags?

A  9 ______________________________________
B  19 ______________________________________
C  6 ______________________________________
D  None of these ______________________________________

(Source: Mooney's Flag Report Help for Students website, March 2002)

Today's Challenge  Fill in the letter of the correct answer. Use the Get Started graph. Estimate to choose the correct answer.

1. Approximately how many flags have exactly three colors?
   A  40  B  76  C  83  D  None of these

2. About how many more flags have three colors than have four colors?
   A  45  B  16  C  31  D  None of these

3. Of the three-color flags, about 28% are red, white, and blue. How many three-color flags are not red, white, and blue?
   A  48  B  12  C  9  D  None of these

4. You could say that about half of the world's flags have
   A  three, four, or five colors.  B  more than two colors.
   C  two, four, or five colors.  D  None of these

5. About how many world flags do NOT have two, three, or four colors?
   A  30  B  15  C  14  D  None of these

6. What advice would you give to a student who is interpreting circle graphs?
   ______________________________________

On today's activity: (Circle one)  I need to know more.  I got it.

Name ____________________________ Date ___
Today's Challenge  Solve each problem.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>P =</td>
<td>((-5)^2 = )</td>
<td>8.</td>
</tr>
<tr>
<td>2.</td>
<td>O =</td>
<td>((-2)^3 = )</td>
<td>9.</td>
</tr>
<tr>
<td>3.</td>
<td>T =</td>
<td>(3^4 = )</td>
<td>10.</td>
</tr>
<tr>
<td>4.</td>
<td>B =</td>
<td>((\frac{1}{2})^2 = )</td>
<td>11.</td>
</tr>
<tr>
<td>5.</td>
<td>F =</td>
<td>(3^3 = )</td>
<td>12.</td>
</tr>
<tr>
<td>6.</td>
<td>W =</td>
<td>(-9^2 = )</td>
<td>13.</td>
</tr>
<tr>
<td>7.</td>
<td>N =</td>
<td>(0.1^2 = )</td>
<td></td>
</tr>
</tbody>
</table>

14. Record the letter of the answer that corresponds to the number below each line to spell a message.

<p>| | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>81</td>
<td>(-\frac{1}{125})</td>
<td>100</td>
<td>25</td>
<td>(-8)</td>
<td>(-81)</td>
<td>100</td>
<td>64</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(-8)</td>
<td>27</td>
<td>0.01</td>
<td>(-27)</td>
<td>(-1)</td>
<td>(\frac{1}{4})</td>
<td>100</td>
<td>64</td>
<td>32</td>
</tr>
</tbody>
</table>

Go Further  Complete the table by raising each number to the given power.

<table>
<thead>
<tr>
<th>x</th>
<th>(-4)</th>
<th>(-3)</th>
<th>(-2)</th>
<th>(-1)</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.</td>
<td>(x^2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>(x^3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17. Describe any patterns you observe in the table.

On today's activity: (Circle one)  I need to know more.  I got it.
Today's Challenge  Same or Different?

1. Play the *Same or Different* game 20 times.
   - If your last name is last in alphabetical order, you are Player A. Your partner is Player B.
   - Player A: place three squares of one color and two squares of a second color in a bag. Shake the bag to mix up the squares.
   - Player B: pick a square. *Without* replacing your square, pick another.
   - Player A: put a tally mark in the table to reflect whether the squares are the same or different.
   - Switch roles and play again.

### 3-2 Game

<table>
<thead>
<tr>
<th>Same</th>
<th>Different</th>
</tr>
</thead>
</table>

2. Based on the data from the table in exercise 1, what is the experimental probability that the two squares picked in a 3-2 game will both be the same color?

   ___________ Different colors? ___________

3. Change the mix of squares in the bag to three of one color and one of a second color. Play 20 games and keep track of your results.

### 3-1 Game

<table>
<thead>
<tr>
<th>Same</th>
<th>Different</th>
</tr>
</thead>
</table>

4. Based on the data from the table in exercise 3, what is the experimental probability that both squares picked in a 3-1 game will be the same color?

   ___________ Different colors? ___________

**On today's activity:** (Circle one)  I need to know more.  I got it.

**Name**  

**Date**
Go Further  Same or Different?

A *fair game* is one in which the players have an equal chance of winning. Work with a partner. Study your results and the class results for activity 137 to decide whether the games are fair.

**Things we discovered:**

1. One way to analyze the game is to construct a sample space for the outcomes. Assume the squares are two red and three blue. Fill in the sample space. Gray cells do not have entries. One cell has been filled in for you.

<table>
<thead>
<tr>
<th>First Pick</th>
<th>First Pick</th>
<th>Second Pick</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red₁</td>
<td>Red₂</td>
<td>Blue₁</td>
</tr>
<tr>
<td>Red₂</td>
<td>Blue₁</td>
<td>Blue₂</td>
</tr>
<tr>
<td>Blue₁</td>
<td>Blue₂</td>
<td>Red₂</td>
</tr>
<tr>
<td>Blue₂</td>
<td>Blue₁</td>
<td>Blue₂</td>
</tr>
<tr>
<td>Blue₃</td>
<td>Blue₁</td>
<td>Blue₂</td>
</tr>
</tbody>
</table>

2. Study the table in exercise 1. What is the theoretical probability that two squares selected in the 3-2 game will be the same color? _____ Different colors? _____

3. Is a 3-2 game of *Same or Different* a fair game? Explain. ____________________________________________

4. On a separate sheet of paper, create a sample space for the 3-1 game.

5. Use your table from exercise 4 to find the theoretical probability of picking two squares the same color in a 3-1 game.

6. Is a 3-1 game of *Same or Different* a fair game? Explain. __________________________________________

**On today’s activity:** (Circle one)  I need to know more.  I got it.

---

**Name**

**Date**
Get Started

1. Complete the table.

<table>
<thead>
<tr>
<th>+</th>
<th>3.1</th>
<th>5.6</th>
<th>6.8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Go Further Solve the riddles.

2. CLUES: • I have a sum of $-2.6$.
   • One of my addends is $-4.1$.
   • What is my other addend? _______

3. CLUES: • I have a sum of 3.5.
   • One of my addends is $-4.8$.
   • What is my other addend? _______

4. Fill in the blanks to make and solve your riddle.
   CLUES: • I have a sum of _______.
   • One of my addends is _______.
   • What is my other addend? _______

5. Now write your own riddle for a friend to solve.
   CLUES: ____________________________
   ____________________________
   ____________________________

What is my other addend? _______
Friend’s name ______________________

On today’s activity: (Circle one) ✈️ I need to know more. ✈️ I got it.

Name __________________________
Date __________________________
Get Started A family has a monthly income after taxes of $2880.00. The two graphs shown illustrate how the family spends its money. Use the graphs to answer the questions.

A. In which graph is it easier to see the relationship between a specific category, such as utilities, and the whole? Explain.

B. In which graph is it easier to approximate how much is spent in a certain category each month? Explain.

C. In which graph is it easier to compare one category to another? Explain.

Today's Challenge
Here is a pictograph of the data used in the Get Started graphs. Use the graph to answer the questions.

1. What is one advantage to using a pictograph instead of a circle graph?

2. What is one disadvantage to using a pictograph instead of a bar graph?

3. What advice would you give to students about using any of the three graphs to make specific points?

On today's activity: (Circle one) I need to know more. I got it.
Today's Challenge  Evaluate these expressions.

1. \(-7 + 3 \times 8\)  
2. \(10 \times 8 - 2\)  
3. \(-6 \times -5 + -6\)  
4. \(9 \times 9 + -2 \times -4\)  
5. \(-5 + 2 \times 7\)  
6. \(5 \times (-5 + 5)\)  
7. \(4 \times -5 \div -2\)  
8. \(48 \div -6 \times 7\)  
9. \(34 - 18 + 12\)  
10. \(-9(5 - 12)\)  
11. \(4 + 9 \times 9\)  
12. \(16 + 40 - 26\)  
13. \(-2 + 8 \times 8\)  
14. \(3 \times 5 - -2\)  
15. \(54 \div 9 \times -3\)  
16. \(-9 \times 4 - 2\)

Go Further  Insert parentheses to make each equation true.

17. \(18 + -9 \div 3 + -20 = -17\)  
18. \(-9 \times 4 - 2 = -18\)  
19. \(6 + 3 \times 8 - 3 = 45\)  

20. Make up four of your own problems using order of operations rules involving integers. Ask a friend to solve them. If your answers do not agree, edit your work.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Friend’s name __________________________

On today’s activity: (Circle one)  I need to know more.  I got it.

Name __________________________
Date __________________________
Today's Challenge: Dependent Events

Use the nine squares given to you and your partner and play the **Same or Different** game. (see activity 137) Play one game 50 times, then write your data on the board. Once all groups have posted their data, record the data for all four cases and use it to help you answer the questions.

<table>
<thead>
<tr>
<th></th>
<th>5-4 Game</th>
<th>6-3 Game</th>
<th>7-2 Game</th>
<th>8-1 Game</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Same</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Different</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Use the table to find the experimental probability that the two squares selected are both the same.

   A. 5-4 game: ____________________________
   
   B. 6-3 game: ____________________________
   
   C. 7-2 game: ____________________________
   
   D. 8-1 game: ____________________________

2. Do any of the four games appear to be fair games? Explain.

   ________________________________________
   
3. Study the results in exercise 1. What happens to the probability that the two squares will be the same as the number of squares of one color increases while the total number of squares stays the same? Explain.

   ________________________________________
   
4. Suppose you have seven red squares and two blue squares in a bag.

   A. If you draw one square, what is the probability that the square will be red? ________
   
   B. If your first pick is red and you draw another square out of the bag without replacing the first one, what is the probability that it will also be red? ________

**On today’s activity:** (Circle one) ☐ I need to know more. ☐ I got it.

Name ____________________________ Date ____________________________
Go Further  Dependent Events

Last time, you found the experimental probabilities for four cases of the Same or Different game. Work with a partner. Study the class results from activity 142 and write anything you discover about the various games.

Things we discovered: ________________________________________________________________

________________________________________________________________________________

If the outcome of a first event changes the probability of a second event, then the two events are dependent. In the game of Same or Different, the square selected on the first draw does affect the probability of the square chosen on the second draw, so the two events are dependent. For exercises 1–4, find the theoretical probability.

1. For the 5-4 game, what is the probability that the two squares are the same?
   __________________ Different? __________________

2. For the 6-3 game, what is the probability that the two squares are the same?
   __________________ Different? __________________

3. For the 7-2 game, what is the probability that the two squares are the same?
   __________________ Different? __________________

4. For the 8-1 game, what is the probability that the two squares are the same?
   __________________ Different? __________________

5. Compare your theoretical probabilities for exercises 1–4 with the experimental probabilities you found for activity 142.
   _____________________________________________________
   _____________________________________________________

On today’s activity: (Circle one) ☐ I need to know more. ☐ I got it.

Name ___________________________ Date __________
Today's Challenge  
Find the value of $x$.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>$3x + 7 = 19$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>2.</td>
<td>$3x - 8 = 10$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>3.</td>
<td>$4x + 9 = 1$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>4.</td>
<td>$-2x + 5 = 3$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>5.</td>
<td>$2x - 5 = 11$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>6.</td>
<td>$2x + 3x = 15$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>7.</td>
<td>$3x - 6 = -18$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>8.</td>
<td>$3x - 2x = 10$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>9.</td>
<td>$x + 3x = -8$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>10.</td>
<td>$2x + 6 = -4$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>11.</td>
<td>$9x - 7 = 20$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>12.</td>
<td>$2x + 3 = 21$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>13.</td>
<td>$5x - 2 = 18$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>14.</td>
<td>$3x - 4x = 5$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>15.</td>
<td>$-2x + 6 = -14$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>16.</td>
<td>$-x - 4 = -12$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>17.</td>
<td>$-4x + 17 = -7$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>18.</td>
<td>$8x - 6x = -8$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>19.</td>
<td>$4x - x = 27$</td>
<td>$x = ___$</td>
</tr>
<tr>
<td>20.</td>
<td>$x + x = 2$</td>
<td>$x = ___$</td>
</tr>
</tbody>
</table>

On today's activity: (Circle one)  
- I need to know more.  
- I got it.

144 Name

Date
Get Started  Circle the letter of the correct answer. Draw another diagram if it helps. 
Find the volume to the nearest cubic centimeter. 
A. 768 cubic centimeters  
B. 1086 cubic centimeters 
C. 192 cubic centimeters  
D. None of these

Today's Challenge  Circle the letter of the correct answer. 
Show your work, including diagrams, on a separate sheet of paper. 
1. Find the area of the rectangular face of Figure 1. 
   A. 15 sq. ft  
   B. 7.5 sq. ft 
   C. 9 sq. ft  
   D. None of these 
2. Find the volume of Figure 1. 
   A. 36 cu. ft  
   B. 45 cu. ft 
   C. 60 cu. ft  
   D. None of these 
3. Find the value of h in Figure 2. 
   A. 15 sq. cm  
   B. 120 cm 
   C. 15 cm  
   D. None of these 
4. Find the surface area of Figure 2. 
   A. 960 sq. cm  
   B. 608 cu. cm 
   C. 480 sq. cm  
   D. None of these 
5. What is the radius of Figure 3? (Use 3.14 for \( \pi \).) 
   A. 14.2 m  
   B. about 17.9 m 
   C. 8 m  
   D. None of these 
6. What is the area of the base of Figure 3? (Use 3.14 for \( \pi \).) 
   A. about 25.1 sq. m  
   B. about 201 m 
   C. about 50.2 sq. m  
   D. None of these 
7. What advice would you give to a student who thinks that necessary measures are missing from a diagram?

On today's activity: (Circle one)  I need to know more.  I got it.

Name  Date
Today's Challenge: Find the value of each expression.

1. What is the value of \(2x + 3\) if \(x = -9\)?
2. What is the value of \(x + 15\) if \(x = 12\)?
3. What is the value of \(-6x - 1\) if \(x = 5\)?
4. What is the value of \(9 - 3x\) if \(x = -7\)?
5. What is the value of \(4 + x^2\) if \(x = -3\)?
6. What is the value of \(x ÷ -4 + 5\) if \(x = 16\)?
7. What is the value of \(-7(x - 3)\) if \(x = 8\)?
8. What is the value of \(8 + \frac{x}{3}\) if \(x = 6\)?
9. What is the value of \(x^2 - 41\) if \(x = 7\)?
10. What is the value of \(37 - 5x\) if \(x = -3\)?

Go Further: Complete the table for the given values of \(x\).

<table>
<thead>
<tr>
<th></th>
<th>-4</th>
<th>-3</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-3x - 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2x + 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. Describe any patterns you observe in the table.

On today's activity: (Circle one)  I need to know more.  I got it.
Today’s Challenge  Painted Cubes

1. Imagine that a cube has been dropped into a can of red paint, then cut into four, nine, or some other number of smaller cubes. Use the diagrams to help you count the number of cubes that have been painted on exactly three, two, one, and zero faces. Write the data in the table.

<table>
<thead>
<tr>
<th>Cubes</th>
<th>Two-Cube</th>
<th>Three-Cube</th>
<th>Four-Cube</th>
<th>Five-Cube</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three Faces Painted</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two Faces Painted</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One Face Painted</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zero Faces Painted</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Study the data in the table for the two- through five-cubes and use it to predict the data for the six-cube.

On today’s activity: (Circle one) □ I need to know more. □ I got it.

Name

Date
Go Further  Painted Cubes

Work with a partner to study the data you collected for activity 147. Write any relationships you discover.

Things we discovered: ______________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________

1. Consider a ten-cube, how many unit cubes will have three faces painted? ______
   If you had an n-cube with n ≥ 2, how many unit cubes would have three faces painted? ______

2. As the length of the side of a cube increases by one, what happens to the number of unit cubes with two faces painted? _______________________

3. Consider a ten-cube, how many unit cubes will have two faces painted? ______
   Write a formula for the number of unit of cubes that would have two faces painted.
   Let F_2 represent unit cubes with two faces painted in an n-cube where n ≥ 2.
   ______________________________________________________________________________________

4. What happens when you divide each of the numbers in the One Face Painted row by six? ______________________

5. Consider a ten-cube, how many unit cubes will have one face painted? ______
   Write a formula for the number of unit cubes that would have one face painted.
   Let F_1 represent unit cubes with one face painted in an n-cube where n ≥ 2.
   ______________________________________________________________________________________

6. Consider a ten-cube, how many unit cubes will have zero faces painted? ______
   Write a formula for the number of unit cubes that would have zero faces painted.
   Let F_0 represent unit cubes with no painted faces in an n-cube where n ≥ 2.
   ______________________________________________________________________________________

7. Use your formulas to find out how many unit cubes have three, two, one, and zero faces painted in a 20-cube.
   ______________________________________________________________________________________

On today’s activity: (Circle one) ☐ I need to know more. ☐ I got it.

Name ___________________________ Date ____________
Today’s Challenge  Look for a string of three digits that could be substituted into an expression in the form \(a(b + c)\) or \(a(b - c)\). The value of the expression should be between 40 and 60. Write the expression and use the Distributive Property to expand and evaluate it.

Example: \(8(3 + 4) = 8 \times 3 + 8 \times 4 = 56\)

<table>
<thead>
<tr>
<th>Expression</th>
<th>Expanded form</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Go Further  Create your own Math Jumble that follows the rules above. Have a friend use your Math Jumble to find three examples. Have your friend write the property, expanded form, and the answer.

<table>
<thead>
<tr>
<th>Expression</th>
<th>Expanded form</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Friend’s name ____________________________

On today’s activity: (Circle one)  \(\text{I need to know more.}\)  \(\text{I got it.}\)

Name ____________________________

Date ____________
Get Started

Substitute \( y = 4.9 \) into the equation \(-2(3y + 4.2) + 7 = 2 - 7y\) to see whether it is a solution. If it is not, solve the equation and check to see that the new solution makes the equation true.

Today's Challenge  Substitute the given value for the variable to see whether it makes the equation true. If it does not, solve the equation and check to see that your solution is correct. You may wish to use a calculator.

<table>
<thead>
<tr>
<th>Equation</th>
<th>Workspace Does Work?</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \frac{6 - 3x}{9} + 5 = 2x + 15 )</td>
<td>(-4)</td>
</tr>
<tr>
<td>( 2m - 3.5 = 20 - 3m )</td>
<td>(3.8)</td>
</tr>
<tr>
<td>( \frac{3y - 2\frac{3}{2}}{2} = 6y - 22\frac{3}{10} )</td>
<td>(4\frac{2}{3})</td>
</tr>
<tr>
<td>( \frac{3 - 4p}{2} = 13 + 3p )</td>
<td>(2.3)</td>
</tr>
<tr>
<td>( 3x^2 + 4x - 15 = 0 )</td>
<td>(-3)</td>
</tr>
</tbody>
</table>

6. For which of exercises 1–5 was a calculator useful? Why?

________________________________________________________________________

________________________________________________________________________

7. What advice would you give to a student who wanted to choose a solution to an equation from a list of choices?

________________________________________________________________________

________________________________________________________________________

On today's activity: (Circle one)  I need to know more.  I got it.
**Today's Challenge**  Fill in the table. Indicate whether the percent change represents increase or decrease. The first is done for you.

<table>
<thead>
<tr>
<th></th>
<th>Original</th>
<th>Amount New</th>
<th>Amount of Change</th>
<th>Percent of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>$250</td>
<td>$300</td>
<td>$50</td>
<td>20% increase</td>
</tr>
<tr>
<td>2.</td>
<td>$400</td>
<td>$200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>$600</td>
<td>$750</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>$100</td>
<td>$400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>$500</td>
<td>$125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>$200</td>
<td>$350</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>$80</td>
<td>$60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>$350</td>
<td>$280</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>$360</td>
<td>$270</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>$150</td>
<td>$375</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Go Further**  When you purchase an item that has a sales tax, the amount you pay is greater than the ticket price of the item. If you know the ticket price (original amount) and the purchase price (new amount), you can compute the percent increase (tax rate).

11. You purchase a $40 sweater and pay $42.40. Explain how to calculate the tax rate you were charged.

When you purchase an item on sale, the amount you pay is less than the ticket price of the item. If you know the ticket price (original amount) and the purchase price (new amount), you can compute the percent decrease (discount rate).

12. You purchase a $96 CD player and pay $76.80. Explain how to calculate the discount rate you received.

**On today's activity:** (Circle one)  I need to know more.  I got it.
Today's Challenge: Exterior Angles of Polygons

Fill in the table by measuring the numbered angles.

<table>
<thead>
<tr>
<th>Figure</th>
<th>Exterior Angle Measures</th>
<th>Sum of Measures of Exterior Angles</th>
</tr>
</thead>
</table>
| ![Triangle](image1.png) | \( \angle 1: \)  
\( \angle 2: \)  
\( \angle 3: \) |                                    |
| ![Quadrilateral](image2.png) | \( \angle 1: \)  
\( \angle 2: \)  
\( \angle 3: \)  
\( \angle 4: \)  
\( \angle 5: \) |                                    |
| ![Quadrilateral](image3.png) | \( \angle 1: \)  
\( \angle 2: \)  
\( \angle 3: \)  
\( \angle 4: \)  
\( \angle 5: \)  
\( \angle 6: \) |                                    |

On today's activity: (Circle one) ☐ I need to know more. ☒ I got it.

Name
Date
Go Further — Exterior Angles of Polygons

No doubt you have seen a pattern to the sum of the exterior angles for the polygons you measured last time. Work with a partner on today's activity.

1. Draw an octagon and a decagon and find the sums of the measures of their exterior angles, then write your observations. You may wish to use another piece of paper.

Things we discovered: ____________________________________________

_________________________________________________________________

_________________________________________________________________

2. What is the sum of the exterior angles of any polygon? _______

3. If all of the exterior angles of a triangle are congruent, what is the measure of each? _______

4. If all of the exterior angles of an octagon are congruent, what is the measure of each? _______

5. A quadrilateral has four exterior angles and a triangle has only three exterior angles. Explain (with words or diagrams) how the sum of the exterior angles of the quadrilateral can be equal to the sum of the exterior angles of the triangle.

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

On today's activity: (Circle one)  I need to know more.  I got it.

Name

Date
Go Further  Follow the directions to mark numbers in the grid. Some numbers will be marked more than once.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>416</td>
<td>845</td>
<td>608</td>
<td>750</td>
</tr>
<tr>
<td>132</td>
<td>209</td>
<td>264</td>
<td>534</td>
</tr>
<tr>
<td>545</td>
<td>600</td>
<td>223</td>
<td>736</td>
</tr>
<tr>
<td>450</td>
<td>904</td>
<td>963</td>
<td>660</td>
</tr>
</tbody>
</table>

1. Cross out all numbers that are divisible by 11.
2. Star all numbers that are divisible by five.
3. Circle all numbers that are divisible by six.
4. Underline all numbers that are divisible by four.
5. Shade all squares containing numbers that are divisible by three.

6. Which number is not marked? __________________

7. Is the answer to exercise 6 divisible by two? How do you know?

   ________________________________________________________

   ________________________________________________________

8. Is the answer to exercise 6 divisible by 18? How do you know?

   ________________________________________________________

   ________________________________________________________

9. What name is given to the type of number you did not mark? ________________

On today's activity: (Circle one) ☐ I need to know more. ☐ I got it.

Name: ___________________________ Date: ____________
Get Started

Problem: If \( x \) is greater than zero, are there maximum and minimum values for \( y \) in \( y = 6 - \frac{4}{x} \)?

Solution:
Try values of \( x \) between zero and one.
If \( x = 0.1 \), \( y = 6 - \frac{4}{0.1} \)
\[ = 6 - 40 \]
\[ = -34 \]
If \( x = 0.01 \), \( y = 6 - \frac{4}{0.01} \)
\[ = 6 - 400 \]
\[ = -394 \]
Since I can make my fractions closer to zero infinitely, it appears that \( y \) can get smaller infinitely.

Try whole-number values of \( x \).
If \( x = 1 \), \( y = 6 - \frac{4}{1} \)
\[ = 2 \]
If \( x = 2 \), \( y = 6 - \frac{4}{2} \)
\[ = 4 \]
Since I can make my whole numbers larger infinitely, the positive number I subtract from six can get smaller infinitely, so \( y \) will get closer and closer to six without going beyond six.

Make a table of values, order \( x \)-values from least to greatest.

<table>
<thead>
<tr>
<th>( x )</th>
<th>( y )</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01</td>
<td>-394</td>
</tr>
<tr>
<td>0.1</td>
<td>-34</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

Write a clear, complete answer to the question.
In \( y = 6 - \frac{4}{x} \), for \( x > 0 \), \( y \) will never be greater than or equal to six, but there is no minimum value for \( y \).

Today's Challenge
On a separate sheet of paper, write a constructed response.

1. Problem: Examine the function \( s = 7 - \frac{w}{3} \) for values of \( w \geq 0 \). Are there maximum and minimum values for \( s \)?

2. What advice would you give someone who was analyzing a function?

On today's activity: (Circle one)  I need to know more.  I got it.

Name  Date
Today’s Challenge  Circle the expression with greater value, then write the absolute value of the difference between the two values.

1. \( \frac{2}{3} \) of 150 or \( 3 \times 33 \) _______
2. \( 3 \times 10^3 \) or 1000 _______
3. \( -\frac{3}{4} \) or \( -\frac{2}{3} \) _______
4. \( (-20)^2 \times 5 \) or \( 2^3 \times 10^2 \) _______
5. \( \frac{1}{3} \) or \( \frac{35}{100} \) _______
6. \( 30 - 8 \times 7 \) or \( 7(12 - 18) \) _______
7. \( 68 - (-34) \) or \( 10^2 \) _______
8. \( 2100 \div (-70) \) or 25% of \( (-40) \) _______
9. 0.7 or 0.07 _______
10. \( 70 \times (-8) \) or \( 80 \times (-6) \) _______

Write the correct comparison, using the symbols >, <, and =.

11. \( \frac{2}{3} \) of 150 \( \square \) \( \frac{1}{2} \) of 200
12. \( (-4)^2 \) \( \square \) \( 5 \times 3 \)
13. \( (-\frac{1}{2})^3 \) \( \square \) -0.3
14. four tenths \( \square \) fourteen hundredths
15. -7.05 \( \square \) -6\( \frac{1}{2} \)
16. \( (-70) \times 8 \) \( \square \) \( 80 \times (-7) \)
17. \( 2^2 \times 3 \) \( \square \) \( 2 \times 3^2 \)
18. \( 25(8 - 2) \) \( \square \) \( 5^2 \times 5 \)
19. \( 1000 - 560 \) \( \square \) \( 100 - 56 \)
20. \( 2.5 \times 3 \) \( \square \) \( 1.5 \times 5 \)

Go Further

21. Write three Which is Greater or Write the Comparison puzzles for a friend to solve. If your answers disagree, edit your work.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Friend’s name ____________________________

On today’s activity: (Circle one)  I need to know more.  I got it.
Today's Challenge  The Diagonal of a Square

1. Draw squares with the dimensions in the table. Record the diagonal length and the ratio of diagonal-length to side-length in the table. Nesting the squares will save space.

<table>
<thead>
<tr>
<th>Side length</th>
<th>Diagonal Length (to the nearest millimeter)</th>
<th>Diagonal Length (to the nearest tenth)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 millimeters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 millimeters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 millimeters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 millimeters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 millimeters</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On today's activity: (Circle one)  I need to know more.  I got it.

Name  Date
Go Further The Diagonal of a Square

Work with a partner to study the class data for activity 157. Write any patterns you notice.

Things we discovered:

1. Test your pattern. Make a length conjecture about the length of the diagonal in a square with sides 70 millimeters long, then measure the length of the diagonal to check your conjecture.

2. Use the pattern to write a formula you could use to find the length of the diagonal of any square.

3. Compare your formula in exercise 2 with the Pythagorean Theorem.

On today's activity: (Circle one) I need to know more. I got it.
Get Started

1. Complete the table. Round answers to the nearest tenth of one cent.

<table>
<thead>
<tr>
<th>Item 1</th>
<th>Unit Price</th>
<th>Item 2</th>
<th>Unit Price</th>
<th>Better Buy?</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 oz for $0.69</td>
<td>10 oz for $0.85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 pounds for $3.40</td>
<td>3 pounds for $4.20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 cans $2.25</td>
<td>6 cans for $3.50</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Go Further  Solve the riddle.

2. **Blues:**
   - I am an item that sells for $1.89.
   - I contain six ounces.
   - What is my unit price per ounce? _________

3. Fill in the blanks to make and solve your riddle. Be sure to include the units.
   **Blues:**
   - I am an item that sells for $__________.
   - I contain ________________.
   - What is my unit price? _________

4. Now write your own riddle for a friend to solve.
   **Blues:**
   __________________________________________
   __________________________________________
   __________________________________________

   What is my unit price? _________
   Friend’s name _______________________

On today’s activity: (Circle one) I need to know more. I got it.

Name ___________________________ Date ____________
Get Started  Estimate. Explain your work.

A.  \( 752 \div 1.3 \)  

B.  \( 112.8 \div 0.24 \)  

Today's Challenge  Match the expression to the correctly filled-in grid. Use estimation to help you explain your reasoning.

1.  \( 475.2 \div 0.54 \)  
2.  \( 158.4 \div 0.36 \)  
3.  \( 10.88 \div 0.85 \)  
4.  \( 7.304 \div 0.22 \)  
5.  \( 5.984 \div 3.2 \)  

A.  

B.  

C.  

D.  

E.  

6. What advice would you give about making good answer choices on a test involving division with decimals?

On today's activity: (Circle one)  I need to know more.  I got it.
**Today's Challenge**  Solve each problem.

<table>
<thead>
<tr>
<th></th>
<th>F =</th>
<th>3 × (-5)^2 = ______</th>
<th></th>
<th>E =</th>
<th>3^4 ÷ 3^3 = ______</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>O =</td>
<td>2^3 - 3^2 = ______</td>
<td>8</td>
<td>R =</td>
<td>5^2 - 5 × 2 ______</td>
</tr>
<tr>
<td>2</td>
<td>U =</td>
<td>3^2 + 9^2 - 3^2 = _____</td>
<td>9</td>
<td>A =</td>
<td>-3 × -4 × -5 = _____</td>
</tr>
<tr>
<td>3</td>
<td>T =</td>
<td>2^2 × 2^2 - 8^2 = ______</td>
<td>10</td>
<td>W =</td>
<td>-(4)^2 ÷ -8 = ______</td>
</tr>
<tr>
<td>4</td>
<td>P =</td>
<td>2^2 - 3^2 = ______</td>
<td>11</td>
<td>N =</td>
<td>25 - 7 × -10 = _____</td>
</tr>
<tr>
<td>5</td>
<td>M =</td>
<td>9 - 9^2 = ______</td>
<td>12</td>
<td>S =</td>
<td>2 × 5^2 + 5 = _____</td>
</tr>
<tr>
<td>6</td>
<td>H =</td>
<td>10^2 ÷ -10 = ______</td>
<td>13</td>
<td>I =</td>
<td>-6 + (-6)^2 = _____</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15. Arrange your answers to exercises 1–14 from least to greatest, place the corresponding letters in these spaces to spell out a message.

<table>
<thead>
<tr>
<th>letter of least answer</th>
<th>letter of greatest answer</th>
</tr>
</thead>
</table>

**Go Further**

16. Write five Order of Operations expressions for a friend to solve. Assign a letter to each problem so that your friend can figure out your mystery word by arranging the answers from least to greatest. If your answers disagree, edit your work.

______________
______________
______________
______________
______________

Mystery Word: ______ ______ ______ ______

Friend's name __________________________

On **today's activity**: (Circle one)  I need to know more.  I got it.
Today's Challenge  
Triangle Relationships

In equilateral triangle $ABC$, segment $AQ$ is the *altitude*. The length of the altitude is called the *height*. The altitude divides the triangle into two congruent right triangles, $\triangle AQB$ and $\triangle CQB$.

1. Measure the equilateral triangles in the table and fill in the data for each one.

<table>
<thead>
<tr>
<th>Triangle</th>
<th>Height (to nearest millimeter)</th>
<th>Length of Side (to nearest millimeter)</th>
<th>Height (\div) Side Length (to nearest tenth)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Triangle 1" /></td>
<td><img src="image2.png" alt="Height 1" /></td>
<td><img src="image3.png" alt="Length 1" /></td>
<td><img src="image4.png" alt="Ratio 1" /></td>
</tr>
<tr>
<td><img src="image5.png" alt="Triangle 2" /></td>
<td><img src="image6.png" alt="Height 2" /></td>
<td><img src="image7.png" alt="Length 2" /></td>
<td><img src="image8.png" alt="Ratio 2" /></td>
</tr>
<tr>
<td><img src="image9.png" alt="Triangle 3" /></td>
<td><img src="image10.png" alt="Height 3" /></td>
<td><img src="image11.png" alt="Length 3" /></td>
<td><img src="image12.png" alt="Ratio 3" /></td>
</tr>
</tbody>
</table>

2. On another sheet of paper, carefully draw an equilateral triangle with seven-centimeter sides. Measure height, then find the ratio of height to side length.

On today's activity: (Circle one) ☐ I need to know more. ☐ I got it.
Go Further  Triangle Relationships

Work with a partner. Study the results of activity 162. Write any interesting discoveries here.

Things we discovered: __________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

1. Write an equation to relate the altitude of an equilateral triangle to the length of its side. __________________________

2. Try your equation: what is the approximate height of an equilateral triangle with five-centimeter sides? ____________

3. Draw the triangle in exercise 2 and measure its altitude. Was your answer about right? If not, revise your equation here. __________________________

4. What is the area of an equilateral triangle with sides 16 centimeters long? Explain how you got your answer.
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

On today's activity:  (Circle one)  I need to know more.  I got it.

Name ____________________ Date ____________________
Today's Challenge

**Example 1**

<table>
<thead>
<tr>
<th>Reflection About: Horizontal Line</th>
</tr>
</thead>
</table>

**Example 2**

<table>
<thead>
<tr>
<th>Rotation: 90° Clockwise</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Reflection About:</th>
<th>Rotation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Line</td>
<td>180° Clockwise</td>
</tr>
<tr>
<td>Horizontal Line</td>
<td>90° Clockwise</td>
</tr>
<tr>
<td>Vertical Line</td>
<td>180° Clockwise</td>
</tr>
<tr>
<td>Horizontal Line</td>
<td>90° Clockwise</td>
</tr>
<tr>
<td>Vertical Line</td>
<td>180° Clockwise</td>
</tr>
</tbody>
</table>

On today's activity: (Circle one)

- I need to know more.
- I got it.

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Get Started  The Great Backyard Bird Count is conducted every year over Presidents’ Day Weekend.

1. Fill in the tally chart by referring to this set of data from the 2002 count.

<table>
<thead>
<tr>
<th>Number of Bird-Species Sighted by State</th>
<th>AL 126</th>
<th>HI 37</th>
<th>MA 125</th>
<th>NE 89</th>
<th>SD 53</th>
<th>AK 78</th>
<th>ID 108</th>
<th>MI 106</th>
<th>NV 117</th>
<th>TN 110</th>
<th>AZ 185</th>
<th>IL 101</th>
<th>MN 81</th>
<th>NC 156</th>
<th>TX 251</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA 239</td>
<td>IA 85</td>
<td>MO 99</td>
<td>OH 108</td>
<td>VT 64</td>
<td>WA 137</td>
<td>CT 103</td>
<td>KY 98</td>
<td>NH 68</td>
<td>OR 159</td>
<td>WA 162</td>
<td>CO 128</td>
<td>KS 88</td>
<td>MT 111</td>
<td>OK 115</td>
<td>WV 88</td>
</tr>
<tr>
<td>DE 99</td>
<td>LA 148</td>
<td>NJ 136</td>
<td>PA 117</td>
<td>DC 56</td>
<td>FL 205</td>
<td>ME 90</td>
<td>NM 159</td>
<td>RI 76</td>
<td>SC 161</td>
<td>WI 100</td>
<td>GA 176</td>
<td>MD 126</td>
<td>NY 132</td>
<td>SC 161</td>
<td>WY 70</td>
</tr>
</tbody>
</table>

Tally Chart

<table>
<thead>
<tr>
<th>Number of Species</th>
<th>Number of States</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–74</td>
<td></td>
</tr>
<tr>
<td>75–149</td>
<td></td>
</tr>
<tr>
<td>150–224</td>
<td></td>
</tr>
<tr>
<td>225–299</td>
<td></td>
</tr>
</tbody>
</table>

Today’s Challenge

2. Make a histogram from the data in your tally chart. Use the grid to the right.

3. On a separate sheet of paper, make another tally chart and histogram from the Bird Count data using intervals of 40 rather than 75.

4. Compare your two histograms. How are they different? How are they the same?

_________________________________________________________

_________________________________________________________

5. What advice would you give to a student trying to decide how to represent data on a histogram?

_________________________________________________________

On today’s activity: (Circle one) I need to know more. I got it.

Name ___________________________ Date ____________
Today's Challenge  Fill in the missing numbers in the sequence.

1. 7, 10, _____, 16, _____, _____, 25
2. -5, _____, -20, _____, _____, -160, -320
3. \( \frac{1}{3}, \frac{2}{4}, \frac{3}{5}, _____, \frac{6}{8}, _____ \)
4. 8, _____, 2, _____, -4, -7, _____
5. 1, 4, _____, 16, _____, _____, 49
6. 3, 4, 6, 9, _____, _____, _____
7. -15, -11, _____, _____, _____, 5, 9
8. -1, -3, -6, _____, _____, _____, -28

Go Further  Ask a friend to solve your problems for exercise 9.
If your answers do not agree, edit your work.

9. Write three sequence problems giving four numbers of the sequence and leaving out three of the numbers.

________________________________________

________________________________________

________________________________________

Friend's name ______________________________

On today's activity: (Circle one)  \( \square \) I need to know more. \( \square \) I got it.
Today's Challenge  How Many Rabbits

Here is a problem that is nearly 1000 years old. A man bought a pair of rabbits and put them in a place surrounded by a wall. At the end of the second month, and every month after that, this pair produced another pair of rabbits. How many rabbits will be produced from that pair in a year if the nature of these rabbits is such that each month, each pair produces a new pair that becomes productive from the second month onward?

1. Keep careful track of new pairs of rabbits and existing pairs of rabbits for six months of the pattern.

<table>
<thead>
<tr>
<th>Beginning of Month</th>
<th>Diagram</th>
<th>Pairs of Rabbits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On today's activity: (Circle one)  I need to know more.  I got it.
Go Further  How Many Rabbits

Work with a partner to study the class data for activity 167. Write your discoveries here. Pay particular attention to how the number of pairs changes from one month to the next.

Things we discovered: __________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

1. Write an equation or otherwise explain how to find the number of rabbit pairs there are at the beginning of month \( n \).

_________________________________________________________________

2. Predict how many rabbit pairs there will be at the beginning of month 12. _____

3. Predict how many rabbit pairs there will be at the beginning of month 15. _____

On today's activity: (Circle one)  I need to know more.  I got it.

168  Name  Date
Today's Challenge  Find a string of three figures arranged horizontally, vertically, or diagonally that share a common attribute. Name the three figures and state the common attribute.

<table>
<thead>
<tr>
<th>Figure</th>
<th>Attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
</tbody>
</table>

![Diagram of figures]

Go Further  Continue the pattern. For each string of figures you found in the jumble, draw another figure that shares the same attribute.

Attribute 1

Attribute 2

Attribute 3

Attribute 4

On today's activity: (Circle one)  I need to know more.  I got it.

Name

Date
Get Started  Draw a diagram to help you solve this problem.

Triangle WEB is similar to triangle FLY. In triangle WEB, WE = 8 feet, EB = 6 feet, BW = 12 feet. In triangle FLY, FL = 16 feet.

A. Which side of WEB corresponds to side LY in FLY? _________

B. Which two sides will you use to show the ratio of corresponding sides? _________

C. How long is LY? _________

Today's Challenge  Draw a diagram to help you solve each problem.

1. Rectangle WORM is similar to rectangle SHIP. In WORM, WO = 10 feet and OR = 12 feet. In rectangle SHIP, the longest side is 18 feet long. How long is the shorter side of rectangle SHIP? _________

2. Right triangle SPY is similar to right triangle WAX. In triangle SPY, SP = 8 centimeters, PY = 6 centimeters, SY = 10 centimeters. In triangle WAX, WA = 12 centimeters. How long is AX? _________

3. Parallelogram QUIT is similar to parallelogram LAMP. The sides of QUIT are five feet and nine feet. The longest side of LAMP is 36 feet. What is the length of the shorter side in LAMP? _________

4. Acute triangle CAT is similar to acute triangle DOG. In triangle CAT, TA = 20 inches, and TC = 30 inches. In triangle DOG, GO = 10 inches. How long is DG? _________

5. What advice would you give to someone who had to find the missing side length in a pair of similar triangles? _________

On today's activity: (Circle one)  I need to know more.  I got it.
Today's Challenge  Calculate the perimeter (or circumference) and area of each figure. For circles give your answers in terms of $\pi$.

1. \[
\begin{align*}
P &= \_\_\_ \quad A &= \_\_\_
\end{align*}
\]

2. \[
\begin{align*}
C &= \_\_\_ \quad A &= \_\_\_
\end{align*}
\]

3. \[
\begin{align*}
P &= \_\_\_ \quad A &= \_\_\_
\end{align*}
\]

4. \[
\begin{align*}
P &= \_\_\_ \quad A &= \_\_\_
\end{align*}
\]

5. \[
\begin{align*}
P &= \_\_\_ \quad A &= \_\_\_
\end{align*}
\]

6. \[
\begin{align*}
P &= \_\_\_ \quad A &= \_\_\_
\end{align*}
\]

Go Further

7. Find five possible heights and bases for a rhombus with an area of 36 square centimeters. Use whole-number units.

8. Relate your answer to exercise 7 to the factors for 36.

On today's activity: (Circle one)  I need to know more.  I got it.

Name  

Date  

171
Today's Challenge  ■  Tiling Pattern

Carefully draw and label four rectangles with different whole-centimeter dimensions. Collect data about the dimensions and the number of one-centimeter squares you need to completely surround each rectangle. Record your data in the table.

<table>
<thead>
<tr>
<th>Labeled Diagram</th>
<th>Perimeter (in centimeters)</th>
<th>Number of One-centimeter Squares to Surround</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On today's activity: (Circle one) □ I need to know more. □ I got it.

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Go Further  Tiling Pattern

Work with a partner to study the data from activity 172. Find patterns in the number of one-centimeter squares needed to surround any rectangle with whole-centimeter dimensions.

Things we discovered:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

1. Use your pattern to determine how many one-foot × one-foot tiles are needed to surround a rectangular swimming pool 30 feet × 40 feet. Explain how you got your answer.
________________________________________________________________________
________________________________________________________________________

2. Write an equation you could use to find the number of one-foot by one-foot tiles surrounding any pool with whole-foot dimensions. Explain each term in your equation.
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

3. If a mason used 240 one-foot × one-foot tiles to surround a rectangular pool, do you know the dimensions of the pool? Explain.
________________________________________________________________________
________________________________________________________________________

On today's activity: (Circle one)  I need to know more.  I got it.

Name
Date
Go Further Follow the directions to mark numbers in the grid. Some numbers will be marked more than once.

<table>
<thead>
<tr>
<th>0.558</th>
<th>0.381</th>
<th>0.342</th>
<th>0.295</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.614</td>
<td>0.584</td>
<td>0.373</td>
<td>0.305</td>
</tr>
<tr>
<td>0.497</td>
<td>0.331</td>
<td>0.337</td>
<td>0.569</td>
</tr>
<tr>
<td>0.598</td>
<td>0.556</td>
<td>0.592</td>
<td>0.449</td>
</tr>
</tbody>
</table>

1. Cross out all numbers that round to 0.34.

2. Star all numbers that round to 0.3.

3. Circle all numbers that round to 0.56.

4. Box all numbers that round to 0.6.

5. Underline all numbers that round to 0.4.

6. Which number is not marked? _________

7. Round your answer to exercise 6 to the nearest tenth. _________

8. Round your answer to exercise 6 to the nearest hundredth. _________

9. Round your answer to exercise 6 to the nearest whole number. _________

On today’s activity: (Circle one) I need to know more. I got it.
Get Started  Greta was taking a test. Here are four examples of Greta’s work. Mark the letter of each problem that Greta has done correctly. Find the value of those she missed.

A  $8 \times 10^3 = \underline{8000}$  B  $7.1 \times 10^3 = \underline{71,000}$
C  $6.2 \times 10^4 = \underline{620,000}$  D  $4.45 \times 10^4 = \underline{44,500,000}$

Today’s Challenge  Fill in the circle next to any correct answer. Write explanations for your choices on the lines provided.

1. Which of these expressions do you think Greta would evaluate correctly? Explain, then find the value.
   A  $5.2 \times 10^3$  B  $6.8 \times 10^4$
   C  $7.6 \times 10^2$  D  $8 \times 10^6$

2. Write four scientific notation expressions that Greta can evaluate, then write their values.

3. Write 12,200 in scientific notation.
   A  $12.2 \times 10^2$  B  $1.22 \times 10^4$
   C  $1.22 \times 10^3$  D  $122 \times 10^2$

4. Write 31,200 in scientific notation.
   A  $3.12 \times 10^4$  B  $31.2 \times 10^3$
   C  $3.12 \times 10^3$  D  $312 \times 10^2$

5. Write 425,000 in scientific notation.
   A  $4.25 \times 10^4$  B  $425 \times 10^3$
   C  $4.25 \times 10^4$  D  $42.5 \times 10^4$

6. Write 551,000,000 in scientific notation.
   A  $5.51 \times 10^8$  B  $5.51 \times 10^6$
   C  $55.1 \times 10^7$  D  $551 \times 10^6$

7. What advice would you give Greta about evaluating expressions written in scientific notation?

On today’s activity:  (Circle one)  I need to know more.  I got it.

Name  Date
Today's Challenge: Compare the measurements using the symbols >, <, or =.

1. Surface Area of Prism A □ Surface Area of Prism B
2. Volume of Prism A □ Volume of Prism B
3. Surface Area of Prism A □ Surface Area of Prism C
4. Volume of Prism A □ Volume of Prism C
5. Surface Area of Prism B □ Surface Area of Prism C
6. Volume of Prism B □ Volume of Prism C
7. Surface Area of Cylinder D □ Surface Area of Cylinder E
8. Volume of Cylinder D □ Volume of Cylinder E

Go Further: Study your answers to exercises 1–8.

9. How does the radius of cylinder D compare to the radius of cylinder E?

10. How does the height of cylinder D compare to the height of cylinder E?

11. If the height of a cylinder is doubled, will the volume double? Explain.

12. If the radius of a cylinder is doubled will the surface area double? Explain.

On today's activity: (Circle one) □ I need to know more. □ I got it.
Today's Challenge = Finding Golden Rectangles

Mathematics researchers claim that most people prefer one of these rectangles much more than any of the others. The reason has to do with the ratio of the longer side to the shorter side in this eye-pleasing rectangle, called The Golden Rectangle. Because many people prefer the shape of the Golden Rectangle, many objects that could be a different shape rectangle are instead manufactured so that they have a shape close to the shape of the Golden Rectangle.

1. Measure the sides of these rectangles and find the ratio of the longer side to the shorter side. Express your ratio as a decimal to the nearest tenth.

   Ratio A: __________
   Ratio B: __________
   Ratio C: __________
   Ratio D: __________
   Ratio E: __________
   Ratio F: __________

2. The Fibonacci series is 1, 1, 2, 3, 5, 8, 13, 21, ... (see activities 167–168). Find the ratio of each Fibonacci number to the previous one. Express your ratios as decimals rounded to the nearest tenth.

<table>
<thead>
<tr>
<th>Number Pair</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 1</td>
<td></td>
</tr>
<tr>
<td>2, 1</td>
<td></td>
</tr>
<tr>
<td>3, 2</td>
<td></td>
</tr>
<tr>
<td>5, 3</td>
<td></td>
</tr>
<tr>
<td>8, 5</td>
<td></td>
</tr>
<tr>
<td>13, 8</td>
<td></td>
</tr>
<tr>
<td>21, 13</td>
<td></td>
</tr>
<tr>
<td>34, 21</td>
<td></td>
</tr>
</tbody>
</table>

On today's activity: (Circle one) I need to know more. I got it.
Go Further Finding Golden Ratios

Work with a partner. Study your data and the class data for activity 177. Report any patterns or interesting facts here.

Things we discovered:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

1. What is the approximate value of the Golden Ratio? __________

2. Measure the three joints of your little finger.
Write the ratios as decimals rounded to the nearest tenth.

A. Measure A: __________

B. Measure B: __________

C. Measure C: __________

D. Ratio of B to A: __________

E. Ratio of C to B: __________

F. Are the bones in your little finger close to the ratio of the sides of a Golden Rectangle? Especially if you have stopped growing, they could be fairly close.

___________

On today's activity: (Circle one) I need to know more. I got it.

178 Name

Date
Get Started

1. Draw all lines of symmetry for the rectangle.

2. How many degrees of rotational symmetry does it have? ______

3. Draw all lines of symmetry for the rhombus.

4. How many degrees of rotational symmetry does it have? ______

5. Draw all lines of symmetry for the square.

6. How many degrees of rotational symmetry does it have? ______

7. How is the symmetry of a square like the symmetry of a rectangle?

8. How is the symmetry of a square like the symmetry of a rhombus?

Go Further # Solve these riddles.

9. **BLUES:**
   - I am a quadrilateral.
   - I do not have rotational symmetry.
   - I have one line of symmetry through the midpoints of a pair of opposite sides.
   - What is my name? ______________

10. **BLUES:**
    - I am a quadrilateral.
    - I have one line of symmetry through opposite vertices.
    - I do not have rotational symmetry.
    - What is my name? ______________

11. Write your own riddle for a friend to solve.

   **BLUES:** ______________________________________

   ______________________________________

What is my name? __________ Friend’s name ______________________

On today’s activity: (Circle one) ☐ I need to know more. ☐ I got it.

Name ___________________ Date __________
Get Started Study the constructed response.

Problem: What is the area of this parallelogram?

Solution:
Decide on the correct area formula.

In a parallelogram $A = bh$, $b$ represents the length of the base, $h$ represents the length of the altitude.

The height is not given.

Decide whether all of the needed information is in the diagram.

The height is a leg of a right triangle for which the lengths of the other leg and the hypotenuse are known.

Decide how to find the missing height.

Compute the height using the Pythagorean Theorem.

$$a^2 + b^2 = c^2$$
$$a^2 + 9 = 25$$
$$a^2 = 16$$
$$a = 4$$

Compute the area.

$$A = bh$$
$$= 13 \times 4$$
$$= 52$$

Write a clear, complete answer to the question. Do NOT forget units.

The area of the parallelogram is 52 square feet.

Today's Challenge On a separate sheet of paper, write a constructed response.

1. Problem: Find the area of this triangle.

2. Problem: Find the area of this trapezoid.

3. What advice would you give to a student who discovers missing information in a problem?

On today’s activity: (Circle one)  I need to know more.  I got it.
Match. Write the correct letter in the blank.

1. five raised to the fourth power a. 13
2. the greatest prime factor of 260 b. 64
3. the number whose prime factorization is $2^2 \times 3^3 \times 5^2$ c. 60
4. the smallest perfect cube that is greater than 100 d. 125
5. the least common multiple of 15, 6 and 20 e. 625
6. the value of $2.7 \times 10^4$ f. 27,000
7. a number that is both a perfect square and a perfect cube g. 2700

8. Write these numbers in order, least to greatest.
   $2\%$, $-1$, $\left(-\frac{1}{2}\right)^2$, $0.12$, $-1.75$, $\frac{1}{9}$

9. Write these numbers in order, least to greatest.
   $(\sqrt{-3})^2$, $\left(-\frac{1}{3}\right)^3$, $\frac{8}{3}$, $3\%$, $33\%$, $0.3$, $2\frac{1}{3}$

10. Round 4.6502 to the
    A. nearest tenth
    B. nearest hundredth
    C. nearest whole number

11. Write the number halfway between $-1\frac{3}{4}$ and $-2$.

12. Write the fraction equivalent to 0.55.

13. Write the decimal equivalent to 250%.

14. Write the greatest common factor of 4a and 6a.

15. Write the percent equivalent to $\frac{1}{8}$.

16. Write all of the factors of 36.

17. Write the least common multiple of 12 and 60.
18. Choose the circle with $66\frac{2}{3}\%$ shaded.
   A. B.
   C. D.

19. Choose the best approximation of $\sqrt{50}$.
   A. 8.1 B. 7.1
   C. 7.9 D. 7.5

20. Which of the following does NOT equal $\left(-\frac{1}{10}\right)^4$?
   A. $\frac{1}{10,000}$ B. 0.0001
   C. $-\frac{1}{10,000}$ D. $\left(\frac{1}{100}\right)^2$

21. Mark the letters of the two equivalent expressions.
   A. $-(9)^2$ B. $(-3)^4$
   C. $(-9)^2$ D. $-(-3)^2$

22. Which number is divisible by 18 but not by 12?
   A. 36 B. 54
   C. 72 D. 108

23. Which number is NOT equivalent to 0.6?
   A. $66\frac{2}{3}\%$ B. $\frac{2}{3}$
   C. $\frac{6}{10}$ D. 0.66

24. I can be written as a percent with two equal digits. I am greater than $\frac{1}{2}$ and less than $\frac{3}{5}$. What is my decimal name? _________

25. Identify each of the following points on the number line provided. Label each point with the appropriate letter.
   A. $\left(-\frac{1}{2}\right)^2$
   B. $(-1)^3$
   C. $\sqrt{2}$
   D. 175%
   E. $\left(-\frac{1}{2}\right)^3$
Fill in the circle of the best answer.

1. Choose the expression that is NOT equivalent to 225.
   A. \( \frac{3}{4} \) of 300  
   B. 33\(\frac{1}{3}\)% of 675  
   C. 1.5 \times 150  
   D. 500 \times \frac{1}{2}

2. Choose the expression that is NOT equivalent to -12.
   A. -25 - -37  
   B. 28 + -40  
   C. 30 - 42  
   D. -7 + -5

3. Choose the expression with a value of -2.
   A. |5 + -7|  
   B. |5| + |-7|  
   C. |5| - |-7|  
   D. |-5| - |-7|

4. If 43.2 divided by 300 equals 0.144, the value of 43.2 divided by 0.03 is
   A. 144  
   B. 1440  
   C. 14.4  
   D. 1.44

5. Choose the expression with the greatest value.
   A. \(2\frac{1}{2}\) \times \(\frac{2}{3}\)  
   B. \(2\frac{1}{2}\) \div \(\frac{2}{3}\)  
   C. 5 - \(2\frac{1}{2}\)  
   D. \(2\frac{1}{2}\) - 5

6. Which of these expressions has a value of -26?
   A. -3 \times 2 + 5 \times -4  
   B. 6 \times (-3 \div 3) + -17  
   C. -2(5 - -7)  
   D. -6 + 7 \times -3

7. Evaluate and write in order, least to greatest.
   \(-\frac{1}{2}\) \times \(-\frac{1}{2}\), \(4 \times \frac{-1}{4}\), \(-1 - \frac{-1}{2}\), \(-\frac{1}{3} \div \frac{4}{3}\)

8. Evaluate -4 - -8. ________  
9. Evaluate 12 - 3. ________

10. Evaluate -5 - 9. ________  
11. Evaluate 11 - 16. ________

12. Find the product of 3.3 and 0.2. ________  
13. Find the sum of \(1\frac{5}{6}\) and \(\frac{1}{3}\). ________
14. Find the difference of 8 and 3.4. ________
15. Find the quotient of 0.504 and 0.3. ________
16. Find the product of $\frac{5}{6}$ and $\frac{2}{3}$ in simplest form. ________
17. Find 10% of $36.20. ________
18. Find 25% of $64.72. ________
19. Find 15% of $5.20. ________
20. Find $33\frac{1}{3}$% of $9.63. ________
21. Start with 36. Find the result after a 50% increase. ________
22. Start with 150. Find the result after a 20% decrease. ________
23. Start with 40. Find the result after a 200% increase. ________

Use the symbol $>$, $<$, or $=$ to make a true statement.

24. $2^3 \times 3^2$ ________ $2^2 \times 3^3$
25. $-50 \times 6$ ________ $-\frac{2}{3} \times 600$
26. $-5(6 - 3)$ ________ $5(-6 - 3)$
27. $0.34 \times 3$ ________ $3.4 \times 0.03$
28. $(-3)^2 \div -3$ ________ $-(3)^2 \div 3$
29. $3\frac{1}{3} + \frac{5}{6}$ ________ $5\frac{1}{2} - \frac{3}{4}$
30. $(-0.2)^2 \times 10$ ________ $\frac{-4 + -6}{-10}$

31. I bought an item with a regular price of $16.00. It was marked 25% off and there was a 5% sales tax. I paid for my purchase with a $20 bill.

   A. Find the amount of the discount. ________
   B. Find the sale price of the item. ________
   C. Find the sales tax on the purchase. ________
   D. Find the amount of change from the $20 bill. ________

32. Jill had 10 hits in 25 times at bat on her softball team this year. What percent of her at-bats resulted in hits?
   
   A. 20%  B. 25%  C. 40%  D. 50%

33. You purchase a $50 sweater on sale for $40. What is the discount rate?
   
   A. 10%  B. 15%  C. 20%  D. 25%
Fill in the circle of the best answer. Draw a diagram if it helps.

1. Choose the diagram that completes the analogy: □ is to □ as □ is to □
   A  □  B  □  C  □  D  □

2. Triangle ABC has a 90° angle at vertex B, AB = 5 centimeters, AC = 13 centimeters. Find the length of BC.
   A  18 centimeters       B  12 centimeters
   C  about 13.9 centimeters   D  144 centimeters

3. Triangle PQR is similar to triangle ABC. PQ = 8 inches, QR = 6 inches and BC = 24 inches. Find AB.
   A  12 inches       B  16 inches
   C  24 inches   D  32 inches

4. Which transformation describes the figure and its image?
   A  90° rotation       B  180° rotation
   C  reflection about horizontal line   D  reflection about vertical line

5. Which equation is graphed?
   A  \( y = x + 1 \)       B  \( y = 2x + 1 \)
   C  \( y = \frac{1}{2}x + 1 \)   D  \( y = -x + 1 \)

6. Choose the net that is NOT a rotation or a reflection of the other three.
   A  □   B  □  C  □  D  □

Match. Select the best name for the polygon with the given attributes.

7. It has no congruent angles, no lines of symmetry, and one pair of parallel lines. a. scalene triangle

8. It has one pair of congruent angles, and the sum of its interior angles is 360°. b. equilateral triangle

9. It has no congruent angles, no lines of symmetry, and the sum of its angles is 180°. c. parallelogram

10. All of its sides and angles are congruent and adjacent sides are perpendicular. d. square

11. All sides are congruent and it has three lines of symmetry. e. kite

12. Adjacent sides are not congruent and both pairs of opposite angles are congruent. f. scalene trapezoid
For exercises 13–18, select the name of the figure from the box.

<table>
<thead>
<tr>
<th>pentagonal prism</th>
<th>sphere</th>
<th>cone</th>
<th>cylinder</th>
</tr>
</thead>
<tbody>
<tr>
<td>triangular pyramid</td>
<td>hexagonal pyramid</td>
<td>triangular prism</td>
<td></td>
</tr>
</tbody>
</table>

13. 

14. 

15. 

16. 

17. 

18. 

True or False

19. The sum of the exterior angles in a pentagon is $360^\circ$.

20. There are six faces, eight vertices, and twelve edges on a rectangular prism.

21. The base of a pyramid must be a regular polygon.

22. The graph of $y = x + 2$ is steeper than the graph of $y = 3x + 1$.

23. If two polygons are similar, then the corresponding angles are congruent.

24. If a side of a square measures one meter, then the diagonal is $\sqrt{2}$ meters.

25. Refer to the diagram shown on the right. Which point is described by all of the following conditions?

   A. $y > x$
   B. $y = -x$
   C. $y = x^2$.

26. Complete the table of values for $y = -2x + 3$.

   Graph the equation on the grid provided on the left.
Match. Write the correct letter in the blank.

1. the number of centimeters in the base of a triangle if the area is 24 square centimeters and the height is 12 centimeters
   a. 2.5

2. the number of inches in the length of a side of a rhombus if its perimeter is 12.8 inches
   b. 3.2

3. the number of feet in the radius of a circle if its circumference is $5\pi$ feet
   c. 10

4. the number of meters in the height of a triangle with area 24 square meters and base 4 meters.
   d. 4

5. the number of meters in the diameter of a circle with area $25\pi$ square meters
   e. 12

Use the diagrams shown for exercises 6–12.

6. Find the surface area of the cube. ____________________________

7. Find the volume of the cube. ____________________________

8. Find the surface area of the rectangular prism. ____________________________

9. Find the volume of the rectangular prism. ____________________________

10. Find the surface area of the cylinder. Leave your answer in terms of $\pi$. __________

11. Find the volume of the cylinder. Leave your answer in terms of $\pi$. __________

12. Find the volume of the triangular prism. ____________________________

13. Find the perimeter. ____________________________

14. Find the perimeter. ____________________________

Find the area. ____________________________

Find the area. ____________________________

Name ____________________________

Date ____________________________
For exercises 15–22, select answers from the box to fill in the blanks.

15. the number of quarts in 2.5 gallons  
16. the number of millimeters in 150 centimeters  
17. the number of ounces in 3\(\frac{3}{8}\) pounds  
18. the number of miles in 15,840 feet  
19. the number of seconds in 1\(\frac{1}{4}\) minutes  
20. the number of quarters in $4.50  
21. the temperature, in degrees Celsius, at which water freezes  
22. the number of meters in 15 kilometers

Use the stem and leaf plot to answer exercises 23–26. The graph shows the ages of 43 participants in a marathon.

23. What is the range?  
24. What is the mode?  
25. What is the median?  
26. How many of the runners were at least 50 years old?

Use the test scores to answer exercises 27–29.

27. Find the mean.  
28. Find the median.  
29. If the student scored 60% on the first test instead of 90%, would the mean or the median be most affected?

30. A family has a monthly income after taxes of $4000. The information shown in the circle graph illustrates how the family spends its money. Use this information to compute how much the family spends on each item and then make a bar graph of your findings on the grid provided.
Fill in the circle of the best answer.

1. Which equation represents the statement, *15 less than my number is −10*?
   
   - **A** \( 15 - x = -10 \)
   - **B** \( x - 15 = -10 \)
   - **C** \( 15 - x = -10 \)
   - **D** \( x - 15 = -10 \)

2. Which expression has the least value when \( x = -2 \)?
   
   - **A** \( 3x - 1 \)
   - **B** \( -2(x + 5) \)
   - **C** \( -1 - x^2 \)
   - **D** \( 4x + 2 \)

3. Choose the expression equivalent to \(-\frac{1}{2}(-8x + 6)\).
   
   - **A** \( (6 - 8x)^{1/2} \)
   - **B** \( 4x + 3 \)
   - **C** \( 4x - 3 \)
   - **D** \( -4x - 3 \)

4. Choose the next three terms in the sequence 1, 4, 9, 16, . . .
   
   - **A** 32, 64, 128
   - **B** 23, 30, 37
   - **C** 20, 25, 30
   - **D** 25, 36, 49

5. Beth gets a weekly allowance of $10.00 and earns $6.00 per hour babysitting. She received a total of $52.00 last week. Which equation could be solved to find the number of hours she baby-sat last week?
   
   - **A** \( 52 = 10h + 6 \)
   - **B** \( 52 = 6h + 10 \)
   - **C** \( 10h = 52 \)
   - **D** \( 52 = 6h \)

True or False

6. In the equation \( y = 2x \), the value of \( x \) is a function of the value of \( y \).
   
   - **__**

7. \(-4\) is a solution to \((1 - 4x) ÷ 2 = \frac{1}{2} - 2x\).
   
   - **__**

8. There are six ways to choose two people from a group of four people.
   
   - **__**

9. Ten 2-digit even numbers can be formed using the digits 1–5.
   
   - **__**

10. If a number cube is tossed and then a coin is tossed, the probability of getting a five followed by tails is \(\frac{1}{12}\).
    
    - **__**

11. Integers and whole numbers are the same set of numbers.
    
    - **__**

12. \(a(b - c) = ab - ac\) is an example of the Associative Property of Subtraction.
    
    - **__**
13. Evaluate $2x^4 + 3$ when $x = -1$. 

14. Solve $\frac{3}{n} = \frac{10}{11}$. 

15. Solve $13 - 3x = -10$. 

16. Evaluate $\frac{5x + 20}{2}$ when $x = -4$. 

Use the pattern to fill in the blanks.

17. $5, 2, -1, -4, \ldots, \ldots$ 

18. $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \ldots, \ldots, \ldots$ 

19. $-5, -4, -2, 1, \ldots, \ldots$ 

20. Jim increased a recipe for a party. The original recipe called for two cups of milk and $\frac{3}{4}$ cup of nuts. The new recipe uses three cups of nuts. How much milk is needed in the new recipe? 

For exercises 21–23, you have three red and two blue squares in a bag.

21. Without peeking, you draw one square out of the bag. What is the probability that the square will be blue? 

22. You draw a blue square. If you draw another square out of the bag without replacing the first square, what is the probability that it will also be blue? 

23. Are the events described in exercise 22 independent events? 

24. Jill buys three CDs and pays the cashier $49.29, which includes $2.79 for sales tax. Write an equation to represent the cost of one CD (without tax). Then find the solution.

For exercises 25–28, use the following statements.

Joe and Joan are each offered temporary jobs for 30 days. Joe will be paid $100 per day. Joan will be paid two cents the first day, four cents the second day, eight cents the third day and so on.

25. Complete the chart for Joan’s salary for the days shown.

<table>
<thead>
<tr>
<th>Day</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary (in cents)</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

26. Write an expression for Joan’s salary (in cents) for the $n$th day.

27. What is the total amount Joe will earn for the 30 days?

28. If Joan will be paid 32,768 cents for the 15th day and the work is similar, which job is better? Explain.
centimeters