



Simply

Good and Beautiful

# MATH



COURSE BOOK



$$30\% \times 10 = 3$$



$60^\circ$

$x^\circ$

$60^\circ$

$A = bh$

pink : yellow  
 $3 : 5$

$$25\% = 0.25 = \frac{25}{100} = \frac{1}{4}$$

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# ABOUT THE COURSE

## Supplies Needed

- 📖 *Simply Good and Beautiful Math 6 Course Book 1* and *Simply Good and Beautiful Math 6 Course Book 2*
- 📖 *Simply Good and Beautiful Math 6 Answer Key*
- 📖 *Simply Good and Beautiful Math Scratch Pad* or other scratch paper
- 📱 Device to access videos (highly recommended)
- 🖋 Pencils
- 🎲 2 standard dice
- 🖍 Colored pencils
- 📐 Protractor
- 📏 Ruler
- ✂ Scissors
- 🍲 Bowl
- 📎 Tape or glue
- 📄 Paper
- 📏 Tape measure

## Course Overview

Math 6 consists of Books 1 and 2. There are 120 total lessons divided into four units. Each unit ends with a unit review and assessment. The course is designed to be completed by the student independently, but parents/teachers can choose to be as involved in the lessons as they would like to be.

## Lesson Overview

Most lessons are four pages and consist of a warm-up, video lesson, mental math, mini lesson, practice, and review.

**Warm-Up:** An activity that applies to the lesson topic.

**Video Lesson:** Videos provide detailed teaching and interactive guided practice of the lesson topic. Scan the QR code or go to [goodandbeautiful.com/Math6](http://goodandbeautiful.com/Math6) to access the videos. Videos are about 12–15 minutes in length.

**Mental Math Checkup:** A quick review of mental math skills and facts practice.

**Mini Lesson:** A concise written lesson on the topic.

**Practice:** Practice that is dedicated to the lesson topic.

**Review:** Daily review of topics from previous lessons.

## Getting Started

Simply open the first course book. Students may choose to watch the video lesson or just read the mini lesson if they feel confident in the lesson topic. Please note that videos may contain material not included in the written mini lesson. Students may complete the warm-up before or during the video. Mental math may be completed at any point during the lesson. After completing the video and/or mini lesson, the student should complete the lesson practice and review sections. Parents/teachers should check the student's work daily and provide immediate help and feedback. Students who struggle with the lesson practice should be encouraged to review the mini lesson or the video for help. *Note: If printing at home, print pages at actual size.*

**Lesson 503**  
**USING PROPORTIONS TO SOLVE PERCENT PROBLEMS**

**Warm-Up**

Divide.

$$22,800 \div 100 =$$

$$1,650 \div 100 =$$

$$228 \div 100 =$$

**Video Lesson**

Scan the QR code or watch the video lesson on [goodandbeautiful.com/Math6](http://goodandbeautiful.com/Math6).

**Mental Math Checkup**

- Convert each percent or decimal to a fraction.
  - 50% =  $\frac{\quad}{100}$      0.75 =  $\frac{\quad}{100}$
- Convert each improper fraction to a mixed number or whole number.
  - $\frac{15}{4} =$   $\frac{\quad}{\quad}$       $\frac{9}{11} =$   $\frac{\quad}{\quad}$
- Simplify using the order of operations.
  - $34 \cdot 12 \div 8 =$       $25 - 5 \cdot 3 =$

**Mini Lesson**

**Finding the Part**

To find a missing part, write the percent over 100. Use a variable for the numerator and write the known whole as the denominator.

Example: What is 7% of 25?

$$\frac{7}{100} = \frac{\quad}{25}$$

Set up a proportion. Write 7% as  $\frac{7}{100}$ .

$$\frac{7}{100} = \frac{\quad}{25}$$

Solve using cross products.

$$100 \cdot \quad = 7 \cdot 25$$

$$100 \cdot \quad = 175$$

$$\quad = \frac{175}{100}$$

$$\quad = 1.75$$

7% of 25 is 1.75.

**Finding the Whole**

To find a missing whole, write the percent over 100. Use a variable for the denominator and write the known part as the numerator.

Example: 11 is 55% of what number?

$$\frac{11}{\quad} = \frac{55}{100}$$

Set up a proportion. Write 55% as  $\frac{55}{100}$ . The part is 11, and the whole is unknown.

$$\frac{11}{\quad} = \frac{55}{100}$$

Solve using cross products.

$$\frac{11}{\quad} = \frac{55}{100}$$

$$11 \cdot 100 = 55 \cdot \quad$$

$$1,100 = 55 \cdot \quad$$

$$\quad = \frac{1,100}{55}$$

$$\quad = 20$$

11 is 55% of 20.

**Finding the Percent**

To find a missing percent, write a variable over 100. Write the known part as the numerator and the known whole as the denominator.

Example: 32 is what percent of 80?

$$\frac{\quad}{100} = \frac{32}{80}$$

Set up a proportion. The percent is unknown. The part is 32, and the whole is 80.

$$100 \cdot \quad = \quad \cdot 80$$

$$100 \cdot \quad = 80 \cdot \quad$$

$$100 \cdot \quad = 40 \cdot \quad$$

$$\quad = \frac{40}{100}$$

32 is 40% of 80.

Sometimes a calculation must be made before setting up and/or after solving a proportion. See the examples below.

Example 1: 52% of the trees in a park are oak trees. If there are 78 oak trees in the park, how many trees are not oak?

$$\frac{52}{100} = \frac{78}{\quad}$$

Use a proportion to find the whole, which is the total number of trees in the park.

$$\frac{52}{100} = \frac{78}{\quad}$$

$$52 \cdot \quad = 78 \cdot 100$$

$$52 \cdot \quad = 7,800$$

$$\quad = \frac{7,800}{52}$$

$$\quad = 150$$

There are 150 trees.

Subtract the 78 oaks from 150 trees.

$$150 - 78 = 72$$

72 trees are not oaks.

Example 2: 65% of the trees in another park are maple trees. If 42 trees are not maple trees, how many maple trees are in the park?

$$100\% - 65\% = 35\%$$

Subtract 65% from 100% to find the percent of trees that are not maple trees.

$$\frac{35}{100} = \frac{42}{\quad}$$

Then set up and solve a proportion.

$$\frac{35}{100} = \frac{42}{\quad}$$

$$35 \cdot \quad = 42 \cdot 100$$

$$35 \cdot \quad = 4,200$$

$$\quad = \frac{4,200}{35}$$

$$\quad = 120$$

There are 120 trees. Subtract 42 non-maple trees from 120. There are 78 maple trees.

**Practice**

- Set up a proportion that would be used to answer each question. You don't need to solve the proportions.
  - What is 10% of 25?
  - 16 is 25% of what number?
  - 16 is what percent of 25?
- For each question set up and solve a proportion to find the missing part.
  - What is 76% of 50?
  - What is 38% of 35?
  - What is 18% of 40?
  - What is 48% of 65?
- Draw a line from each question on the left to its answer on the right.
  - 39 is 40% of what number? 45
  - 36 is 80% of what number? 47
  - 25.3 is 55% of what number? 47.5
  - 42.3 is 90% of what number? 46
- Match each question with its answer by evaluating the boxes the same color. Use a different color for each match.
 

Find the Whole		Find the Percent	
36 is what percent of 80?	32.5 is what percent of 50?	46%	45%
25%	30%	46%	54 is what percent of 90?
23 is what percent of 50?	23 is what percent of 50?	46 is what percent of 100?	65%
60%	55%	17.5 is what percent of 50?	49.5 is what percent of 90?

**Practice**

- Solve each problem. Locate all the boxes containing the solution on the grid, and shade in the solutions that best according to the design listed next to the problem.
 

42	78	78	40
80	40	42	81
42	81	80	40
80	78	78	81

  - What is 70% of 60?
  - 44 is 80% of what number?
  - 88 is what percent of 90?

**Review**

- You pulled a black sock from the clothes dryer. What is the probability that, without looking, you will pull out another black sock if the dryer now contains 5 black socks, 6 blue socks, and 8 gray socks? [Lesson 5](#)
- In a sewing contest, the ratio of clothing entries to quilt entries was 1:3. If there were 48 entries, how many of them were quilts? [Lesson 5](#)
- Convert the units of capacity. [Lesson 6](#)
  - 4 gal  $\rightarrow$  cups
  - 430,000 mL  $\rightarrow$  liters
- Boxes that are 10 in tall are being stacked next to boxes that are 36 in tall. At how many inches will the two stacks first be the same height? [Lesson 3](#)
- Subtract the integers. [Lesson 3](#)
  - $56 - 38 =$
  - $28 - 56 =$
  - $97 - 43 =$
  - $43 - 97 =$

A Reference Chart is included at the end of each course book.

# Frequently Asked Questions

## How many lessons should my student do each week?

- There are 120 lessons in the course. If the student completes four lessons per week, he or she will complete the course in a standard school year with typical breaks for vacation or sickness.

## How long do lessons take?

- The average time to complete a lesson is 45–60 minutes. This includes time to watch the video and complete the course book sections.

## What if my child is too slow/fast?

- If your child takes longer than average but is understanding and retaining information, don't worry. You may want to break up the lessons. Watch the video and begin the practice. Then finish the practice and complete the review section at another time.
- To avoid holes in his or her math foundation, we suggest not skipping entire levels if your child works more quickly than average but is learning new concepts. Consider having your child do multiple lessons a day to complete the course faster.
- If your child takes less time than average and seems to already know all the information, consider giving the Unit Assessments to see if he or she can skip any units or move on to the next course.

## Do you include any specific doctrine?

- No, the goal of our curriculum is not to teach doctrines specific to any particular Christian denomination but to teach general principles such as honesty, hard work, and kindness. All Bible references in our curriculum use the King James Version.

## Does my student have to watch the videos?

- The videos contain the bulk of the teaching and are highly recommended. However, if your student feels confident in the topic being taught, he or she can skip the video and read the mini lesson instead. A student who struggles with the lesson practice should be encouraged to go back and watch the video.
- Some families prefer to have the parent/teacher teach the child using the mini lesson rather than have the child watch the video lesson independently.

## Is Math 6 completed independently by the child?

- Yes, Math 6 is designed for your student to complete independently, though at times students may need parent/teacher assistance to understand a concept. Parents/teachers will need to check the child's work and should do so on a daily basis when possible, providing immediate feedback.

## Is Math 6 a spiral or mastery program?

- Math 6 is a spiral course, constantly reviewing concepts your student has learned to ensure understanding and retention of information.

## What if there isn't room to complete the work?

- Students should always keep scratch paper on hand while completing the lessons. The *Simply Good and Beautiful Math Scratch Pad* is available for purchase.

## Is a calculator used in Math 6?

- This course is designed to be completed without the use of a calculator. Lesson 117 is an introduction to calculators. A scientific calculator is helpful in this lesson but isn't necessary. Calculators should not be used for any other lessons.

# UNIT 1 OVERVIEW

## LESSONS 1-30

### Extra Supplies Needed

- 1 standard die
- colored pencils

### New Concepts Taught

- absolute value
- area of a parallelogram
- area of a trapezoid
- distance on a coordinate plane
- division with a three-digit divisor and a six-digit dividend
- expanded notation of decimal numbers through the millionths place
- expanded notation with exponents
- greatest common factor of three-digit numbers
- identity and inverse properties
- negative fractions and decimal numbers on a number line
- nets and surface area of trapezoidal prisms and parallelepipeds
- prime factorization of four-digit numbers
- prime factorization to determine least common multiples
- rational numbers with exponents

### Concepts Reviewed and Expanded Upon

- addition, subtraction, multiplication, and division of decimal numbers
- addition, subtraction, multiplication, and division of fractions
- area of a triangle
- area of irregular figures
- associative, commutative, and distributive properties
- convert between fractions, decimal numbers, and percents
- convert between improper fractions and mixed numbers
- divisibility rules
- equivalent fractions
- fraction comparisons
- fractions in simplest form
- negative numbers
- number patterns and infinite sequences
- order of operations
- triangle classification

# OPPOSITES AND ABSOLUTE VALUE

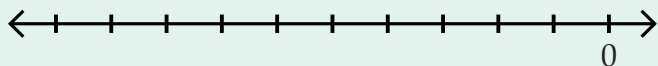
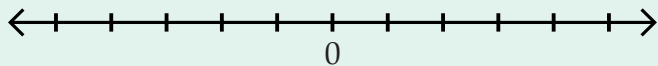
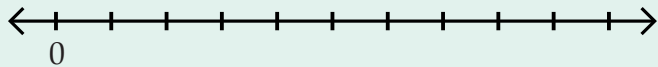
Watch the video lesson and/or read the mini lesson.

## Warm-Up

The warm-up is discussed in the video.

This section can be completed either before or during the video.

Using a scale that counts by one, label the missing numbers on each of the number lines.



## Video Lesson



Scan the QR code or watch the video lesson on [goodandbeautiful.com/Math6](http://goodandbeautiful.com/Math6). This section is completed during the video.


$$|14| \bigcirc |-14|$$

## Mental Math Checkup



Write the answers in the spaces provided. This section is completed independently.

1. Count by 100 from 0 to 1,000.

2. Add 1,000 to each number.

239,719

76,736

3,791

3. What is the third month of the year?

## Mini Lesson

An *integer* is a number with no fractional part.

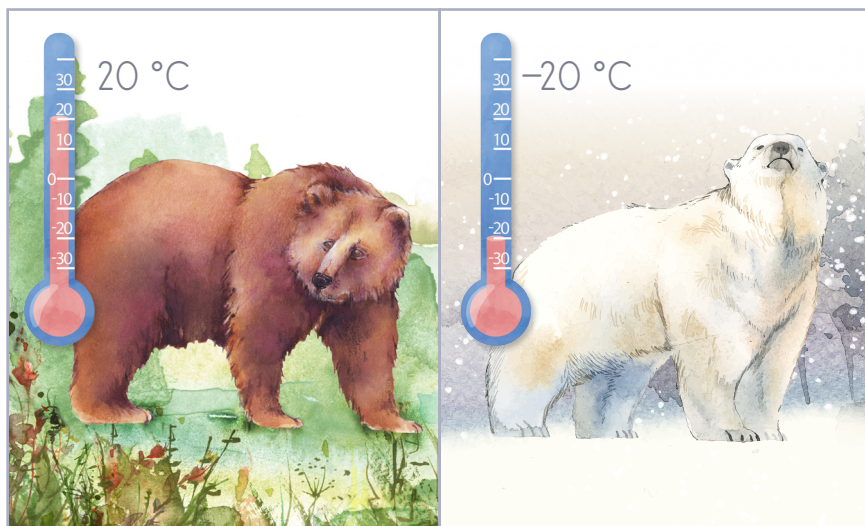
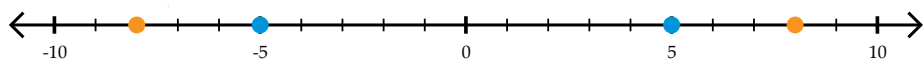
Examples of integers: 34, -2, 0, 15, -55, -102

Examples of non-integers:  $\frac{1}{4}$ , 3.2,  $\frac{7}{8}$ ,  $\pi$ , 4.333...

Integers can be positive or negative. *Negative numbers* are numbers less than zero, and *positive numbers* are numbers greater than zero. Zero is not positive or negative. A negative sign is written in front of negative numbers.

*Opposites* are two numbers that are the same distance from zero but on opposite sides of a number line.

Examples: 5 and -5 are opposites. -8 and 8 are opposites.



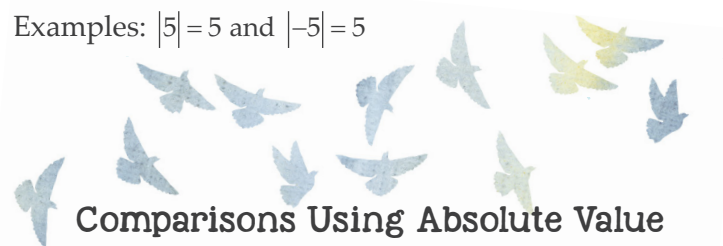
*Absolute value* is the distance a number is from zero on a number line. Distance cannot be negative, so absolute values are never negative. A number and its opposite have the same absolute value.

The opposite of 0 is 0.  
The absolute value of 0 is 0.

Examples: The absolute value of 5 is 5. The absolute value of -5 is 5. Both 5 and -5 are five units from zero.

A vertical line on each side of a number indicates absolute value.

Examples:  $|5| = 5$  and  $|-5| = 5$



To compare two absolute values, find the absolute value of each number, then compare using a  $<$ ,  $>$ , or  $=$ .

Compare the absolute value of -45 and the absolute value of 30.

$$\begin{aligned} |-45| &\bigcirc |30| \\ 45 &> 30 \\ |-45| &> |30| \end{aligned}$$

-45 is farther from zero than 30.

Compare the absolute value of 7 and the absolute value of -10.

$$\begin{aligned} |7| &\bigcirc |-10| \\ 7 &< 10 \\ |7| &< |-10| \end{aligned}$$

7 is closer to zero than -10.

Practice

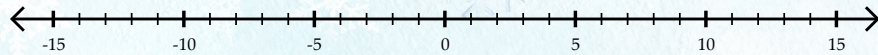
1. If the number is an integer, write "yes" on the line. If not, write "no."

7 \_\_\_\_\_    -40 \_\_\_\_\_    0 \_\_\_\_\_     $\frac{4}{5}$  \_\_\_\_\_  
 5.1 \_\_\_\_\_     $\frac{1}{3}$  \_\_\_\_\_    -21 \_\_\_\_\_    -8.4 \_\_\_\_\_

2. Write each of the expressions as an integer. Some examples are given.

a loss of \$2,000    -2,000    500 ft below sea level \_\_\_\_\_  
 a drop of 15 °F    \_\_\_\_\_    a debt of \$10    \_\_\_\_\_  
 a price increase of \$60    60    a deposit of \$50    \_\_\_\_\_  
 125 ft above sea level    \_\_\_\_\_    a withdrawal of \$50    -50  
 30 degrees below zero    \_\_\_\_\_    a gain of \$45    \_\_\_\_\_

3. Find the opposite of each number. Use the number line for help if necessary.



Number	Opposite	Number	Opposite
4		12	
7		-12	
-2		-5	
-1		8	
0		3	

4. Find the absolute value of each number.

$|450|$      $|-22|$      $|0|$      $|-108|$   
 $|15|$      $|-15|$      $|-3|$      $|18|$

5. Find the change from the first temperature to the second. Write the change as an integer.

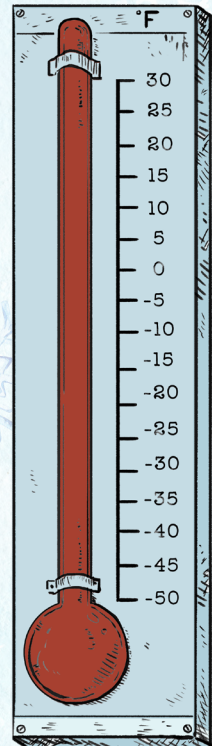
5 °F to 15 °F \_\_\_\_\_    -50 °F to -25 °F \_\_\_\_\_  
 0 °F to -15 °F \_\_\_\_\_    -10 °F to -35 °F \_\_\_\_\_  
 25 °F to 15 °F \_\_\_\_\_    -5 °F to 15 °F \_\_\_\_\_

6. Compare the following using  $<$ ,  $>$ , or  $=$ .

$|0|$  ○  $|-5|$      $7$  ○  $|2|$      $|-4|$  ○  $|4|$   
 $|5|$  ○  $7$      $|-15|$  ○  $|-23|$      $32$  ○  $|-30|$

7. Cross off the incorrect absolute values.

$|-15| = 15$      $|-15| = -15$   
 $|-5| = -5$      $|-5| = 5$   
 $|15| = -15$      $|15| = 15$   
 $|5| = 5$      $|5| = -5$





### Practice

8. Circle the greater value in each row.
- a. the opposite of 3                       $|2|$
  - b.  $|-25|$                                       the opposite of  $-24$
  - c.  $|-14|$                                        $-14$
  - d. the opposite of 4                      the opposite of  $-4$
  - e.  $|10|$                                         ten less than zero
  - f. the opposite of 8                       $-9$

9. Circle the correct word in *italics* to make a true statement.

The absolute value of a positive number is a *positive / negative* number.

The absolute value of a negative number is a *positive / negative* number.

The opposite of a positive number is a *positive / negative* number.

The opposite of a negative number is a *positive / negative* number.

10. Complete the chart below. The first row is given as an example.

Number	Opposite	Absolute Value
$-\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$
3.4		
-27.482		
$-\frac{1}{5}$		
$\frac{3}{10}$		
-50.5		

### Review

1. Circle the even numbers and cross out the odd numbers.

589,137    1,792,870    84,781,791    901,728,176

2. Compare each pair of numbers using  $<$ ,  $>$ , or  $=$ .

6,371,278  6,372,278

5.810  5.81

431,081  431,801

3. Complete each problem.

$654 \div 3 =$  \_\_\_\_\_     $382,718 + 12,795 =$  \_\_\_\_\_

$5,361 \times 12 =$  \_\_\_\_\_     $265,710 - 12,795 =$  \_\_\_\_\_

4. List the next five multiples of each number.

20, \_\_\_\_\_

50, \_\_\_\_\_

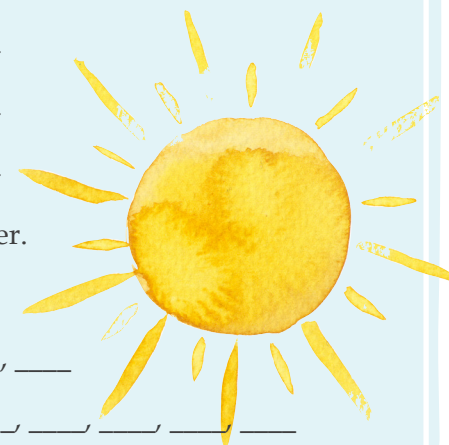
12, \_\_\_\_\_

5. List the factors of each number.

25: \_\_\_\_\_

32: \_\_\_\_\_

100: \_\_\_\_\_



# ADDING, SUBTRACTING, AND MULTIPLYING FRACTIONS AND MIXED NUMBERS

▶ Watch the video lesson and/or read the mini lesson.

## Warm-Up

Complete the problems.



## Video Lesson



Scan the QR code or watch the video lesson on [goodandbeautiful.com/Math6](http://goodandbeautiful.com/Math6).

$$7\frac{3}{4} - 3\frac{1}{4}$$

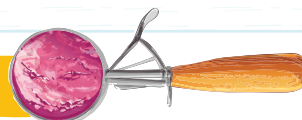
$$\frac{2}{3} \times \frac{5}{9} \times \frac{3}{10}$$



## Mental Math Checkup

- Count by 30 from 0 to 300.
- Multiply each number by 1,000.  
712       42   
1,270
- How many nickels are in \$2.00?

## Mini Lesson



### Adding and Subtracting Fractions

When adding or subtracting fractions with different denominators, first convert the fractions to equivalent fractions with a common denominator. Then add or subtract the numerators. The denominator stays the same.

$$\frac{3}{10} + \frac{7}{8} = \frac{12}{40} + \frac{35}{40} = \frac{47}{40} = 1\frac{7}{40}$$



### Subtracting a Fraction or Mixed Number from a Whole Number

To subtract a fraction or mixed number from a whole number, write the whole number as a mixed number or improper fraction by taking 1 from the whole number and writing it as a fraction equal to 1. Use the same denominator as the fraction being subtracted. Then subtract.

$$1 - \frac{8}{15} =$$

$$\frac{15}{15} - \frac{8}{15} = \frac{7}{15}$$

$$12 - 4\frac{1}{2} =$$

$$11\frac{2}{2} - 4\frac{1}{2} = 7\frac{1}{2}$$

### Adding and Subtracting Mixed Numbers

$$8\frac{4}{9} + 11\frac{7}{9} =$$

Add the whole numbers, and then add the fractions.

$$19\frac{11}{9} =$$

$$19 + 1\frac{2}{9} =$$

$$20\frac{2}{9}$$

Write answers in simplest form.

The same principles apply to subtracting mixed numbers: subtract the whole numbers, and then subtract the fractions.

### Multiplying Fractions by Fractions, Whole Numbers, and Mixed Numbers

To multiply fractions, multiply the numerators, and then multiply the denominators.

$$\frac{6}{7} \times \frac{11}{12} = \frac{66}{84} = \frac{11}{14}$$

To multiply a fraction by a whole number, first convert the whole number to a fraction by writing it with a denominator of 1. Then multiply the fractions.

$$5 \times \frac{4}{15} = \frac{5}{1} \times \frac{4}{15} = \frac{20}{15} = 1\frac{5}{15} = 1\frac{1}{3}$$

To multiply mixed numbers, first convert the mixed numbers to improper fractions. Then multiply the fractions.

$$2\frac{1}{5} \times 3\frac{1}{2} = \frac{11}{5} \times \frac{7}{2} = \frac{77}{10} = 7\frac{7}{10}$$

### Canceling Before Multiplying Fractions

Canceling is a way to simplify fractions before multiplying them. To cancel, find one numerator and one denominator that are divisible by the same factor. Divide both the numerator and the denominator by that factor and write the quotients in place of the canceled numbers.

Then multiply the fractions.

$$\frac{\cancel{2}^1}{7} \times \frac{3}{\cancel{4}_2} = \frac{3}{14}$$

$$\frac{\cancel{2}^1}{3} \times \frac{\cancel{6}_2}{\cancel{25}_5} = \frac{2}{15}$$

$$\frac{\cancel{7}^1}{10} \times \frac{\cancel{2}^1}{\cancel{3}_1} \times \frac{\cancel{3}_1}{\cancel{14}_2} = \frac{3}{5}$$

Cancellations may be performed in any order; just make sure to divide both a numerator and a denominator by the same number.

### MATH TIP!

Canceling first makes multiplying fractions easier. If all common factors are canceled before multiplying, the answer will be in simplest form.

Complete each problem in the ice cream scene. Once you find the answer, use the matching letter to solve the riddle.



**F**

$$\frac{9}{14} + \frac{17}{28} = \square$$

**T**

$$1\frac{6}{11} + \frac{1}{2} = \square$$

**C**

$$8\frac{4}{6} + 5\frac{1}{9} = \square$$

**H**

$$\frac{4}{5} + \frac{9}{10} = \square$$

**E**

$$\frac{11}{15} - \frac{3}{5} = \square$$

Why did the ice cream truck break down?

$$\frac{3}{4} \quad \frac{2}{15} \quad 13\frac{7}{9} \quad \frac{6}{11} \quad 13\frac{1}{6} \quad \frac{2}{9} \quad \frac{2}{15} \quad 1\frac{19}{40} \quad 1\frac{1}{4}$$

$$2\frac{1}{22} \quad 1\frac{7}{10} \quad \frac{2}{15} \quad 6\frac{1}{7} \quad 1\frac{19}{40} \quad 13\frac{7}{9} \quad 2\frac{13}{15} \quad 7\frac{2}{11}$$

$$6\frac{1}{7} \quad 1\frac{19}{40} \quad \frac{6}{11} \quad 6\frac{1}{12}$$

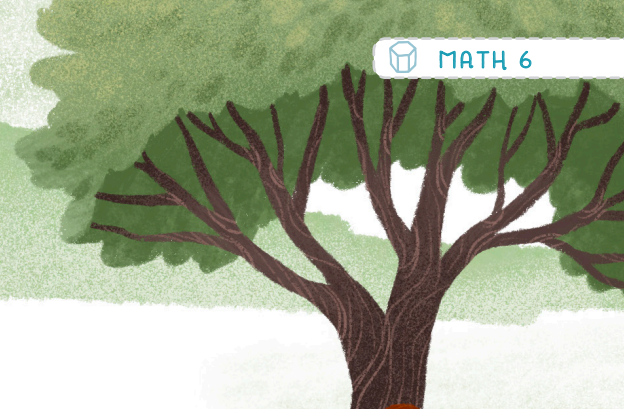
**O**

$$\frac{7}{8} + \frac{3}{5} = \square$$

**B**

$$\frac{8}{16} + \frac{8}{32} = \square$$





**S**  $\frac{5}{9} - \frac{1}{3} =$

**U**  $8\frac{1}{2} + 4\frac{2}{3} =$

**R**  $7 - \frac{6}{7} =$



**A**  $2 - 1\frac{5}{11} =$



**K**  $5 - 2\frac{2}{15} =$

$8 - \frac{9}{11} =$

**Y**



**D**  $13\frac{3}{4} - 7\frac{2}{3} =$

# MUSEUM LOGIC

There is no video or review for this lesson.

## Instructions

Welcome to the museum! Today you are taking a guided tour through the museum with your homeschool group. As your tour guide explains each exhibit, you are in awe of how much history there is to learn. Midway through the tour, your guide allows for a quick break to use the restroom and look around. You and a couple of friends head to the Egypt exhibit. You love exploring the hieroglyphics, and you lose track of the time. You and your friends finally find your way back to where the tour guide was, but she and your group are nowhere to be found. Pull out and cut apart the puzzle cards on the following pages. Then solve the puzzles to gather clues that will help you and your friends find the location of your group.

## Map of the Museum



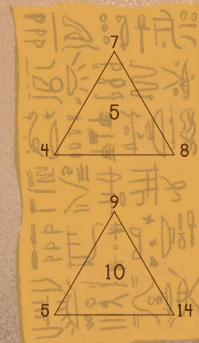
## Riddle

Your tour group is in the

6 8 12 4 6 1 1 E 8 5 .



 2



$$\triangle \times \text{goat} \times \text{goat} = 12$$



 8

### PUZZLE 1

Find the value of each image in this multiplication table. The sum of the values for each symbol is the clue for the riddle.

			
3	6	15	12
			
		10	8













 $=$  T


### PUZZLE 2

Some of the answers to the problems listed are lost in the museum. Search the museum for the missing answers and fill them in. Then solve for the unknown symbols. The value of the unknown symbol is the clue for the riddle.


 $+$ 

 $=$  6


 $\times$ 

 $\times$ 

 $=$  \_\_\_\_\_











 $+$ 

 $+$ 

 $=$  \_\_\_\_\_


 $=$  G

### PUZZLE 3

Place each of the digits below in one of the suns. The three numbers connected by lines need to add up to 15. The number found in the yellow sun is the clue for the riddle. Three numbers are already placed for you.

1 2 3 4 5 6 7 8 9

			15
			15
			15
15	15	15	15

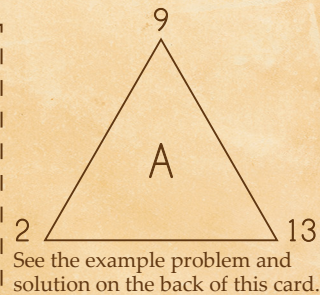
See the example problem and solution on the back of this card.

Pull this page out and cut apart the puzzle cards.

### PUZZLE 4

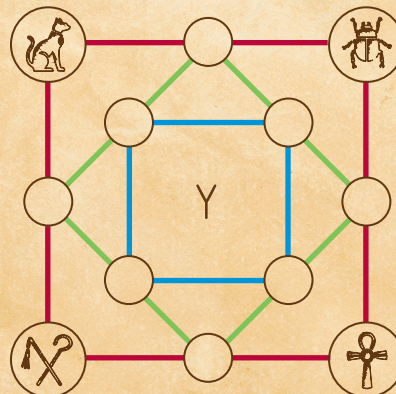
In the museum, find the two pyramids with numbers and copy them on this card. Start at the bottom right vertex. As you travel around to each vertex, figure out which operations must be performed with the numbers to equal the number in the middle. Then use the same operations and travel in the same direction to find the answer to this puzzle. See the example on the back of this card. The value for the letter in the triangle is the clue for the riddle.

Copy pyramids here.



### PUZZLE 5

Find the values for each of the symbols in the illustration. For each side of the red and green squares, write the difference between the corners in the circle on that side. The numbers at the corners of the blue square should be the same. That number is the value for the letter found in the center of the blue square and is the clue for the riddle.






HINT: Subtract the smaller number from the larger number.

See the example problem and solution on the back of this card.

### PUZZLE 6

Find the symbols in the illustration. Then complete each division problem. The number found in the yellow square is the clue for the riddle.

24	$\div$		$=$	
$\div$		$\div$		$\div$
	$\div$		$=$	
$=$		$=$		$=$
	$\div$		$=$	L



# UNIT 1 REVIEW



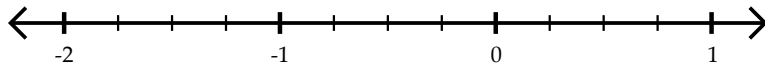
Welcome! My name is Thomas, and this is my sister, Holly. In today's lesson you will visit children from different countries around the world. As you travel to each country, you will practice different math concepts you've learned so far in Unit 1.

I'm Gretchen, and this is Hanz! When you visit each country, you will meet many of our friends wearing traditional clothing from their country. These friends will share something interesting about the country they live in. Enjoy your travels!

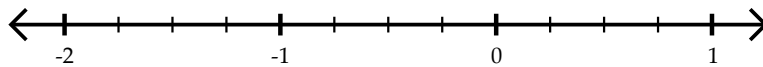


## Fractions, Decimals & Number Lines Lessons 4 & 14

- Use fractions and mixed numbers to fill in the missing values on the number line.
- Plot these points on the number line. Point A:  $-1.25$  Point B:  $0.75$  Point C:  $-0.5$
- Write the fractions in order from least to greatest in simplest form.



$$\frac{9}{13}, \frac{5}{11}, \frac{7}{14}$$



\_\_\_\_\_

### Opposites & Absolute Value Lesson 1

1. Find the opposite of each number.

9 \_\_\_\_\_       $\frac{4}{7}$  \_\_\_\_\_      -1.05 \_\_\_\_\_

2. Find the absolute value of each number.

$|6.8| =$  \_\_\_\_\_       $|-71| =$  \_\_\_\_\_       $|\frac{-1}{3}| =$  \_\_\_\_\_

3. Compare the following using  $<$ ,  $>$ , or  $=$ .

$|-45| \bigcirc |-54|$        $|38| \bigcirc |-38|$



The highest peak in Mexico is a volcano that reaches 18,491 ft (5,636 m) high. It is also one of the highest peaks in North America.

### Prime Factorization, GCF & LCM Lessons 2, 3 & 8

1. Find the prime factorization of each number. Then find the GCF of the numbers.

12: \_\_\_\_\_ GCF: \_\_\_\_\_

32: \_\_\_\_\_

2. List the first few multiples of each number. Then find the LCM of the numbers.

10: \_\_\_\_\_ LCM: \_\_\_\_\_

8: \_\_\_\_\_

The northern region of Russia is a tundra with a snow-covered landscape. Reindeer, also known as caribou, are one type of animal able to survive in the tundra.



### Addition, Subtraction, Multiplication, Division & Rounding Lessons 5, 9, 12, 13, 16, 17 & 25

1. Add or subtract.

$2\frac{1}{2} + \frac{4}{5} =$  \_\_\_\_\_       $4 - \frac{2}{3} =$  \_\_\_\_\_       $6.712 - 4.8 =$  \_\_\_\_\_

2. Multiply or divide. ◆ Hint: You can cancel before multiplying fractions.

$\frac{12}{25} \times \frac{10}{16} =$  \_\_\_\_\_       $\frac{1}{5} \div \frac{3}{7} =$  \_\_\_\_\_

$4.183 \times 3.9 =$  \_\_\_\_\_       $5.75 \div 0.25 =$  \_\_\_\_\_

3. Round 12.870513 to the place values below.

ten thousandths: \_\_\_\_\_

hundred thousandths: \_\_\_\_\_

thousandths: \_\_\_\_\_

Japan has many hot springs called *onsens*, where local snow monkeys go to bathe and keep warm.



### Conversions Between Fractions, Decimals & Percents Lessons 23 & 24

Complete the table.

Fraction	Decimal	Percent
$\frac{2}{5}$		
	0.64	
		90%



Germany has more than 20,000 castles scattered among the mountains and lakes in the countryside.

### Expanded Notation Lessons 11 & 18

1. Write 8.517 in expanded notation using . . .

fractions \_\_\_\_\_

decimals \_\_\_\_\_

2. Write  $(8 \times 10^5) + (7 \times 10^4) + (2 \times 10^2) + (1 \times 10^1) + (8 \times 10^0)$  in standard form.

\_\_\_\_\_



China is home to many endangered animals, including the South China tiger and the giant panda.

### Rational Numbers with Exponents & Order of Operations Lessons 19 & 20

1. Underline the integers. Circle the rational numbers.

5.2      $-\frac{5}{7}$      -12     -2.82     0      $4\frac{1}{3}$

2. Simplify the expressions.

$\left(\frac{3}{5}\right)^2 =$  \_\_\_\_\_      $50 + (7 - 3)^2 \div 2 =$  \_\_\_\_\_      $\frac{9 - 2^2}{4 \cdot 5} =$  \_\_\_\_\_

Brazil is home to the Amazon rainforest—the largest rainforest in the world.



# UNIT ASSESSMENT

## Instructions

Unit assessments give you practice with the math concepts learned in this unit without having you overpractice concepts that you have mastered. These assessments also give you practice working on math problems for an extended period of time. This helps you to extend focus and attention span and to be better prepared for any type of testing you will have to do in the future. Here are some tips: First, always read the instructions carefully. Sometimes you can get answers wrong simply because you did not understand the instructions. Second, do not rush through exercises you think you already know. Instead, do your work carefully. Sometimes you can get answers wrong, even though you understand the concept, just because you rushed. Finally, if you feel you are having trouble focusing, take a quick break to do something else, like ten jumping

jacks, and then come back. There are no videos, mini lessons, or practice problems for Lessons 29–30.

- For Lesson 29**, complete all the exercises with purple headers only. You may cover the additional practice sections or fold the page to concentrate only on the purple sections. Have your parent or teacher correct the work. If there are mistakes in a section, your parent or teacher will check the orange “Additional Practice” checkbox for that section.
- For Lesson 30**, complete all the orange sections that are checked. If you still make multiple mistakes, review those sections. All the principles will be reviewed again in upcoming units. If you have only a few or no orange sections to practice, you may move on to the next lesson.
- Parents/teachers may determine if the student may use the Reference Chart for the assessment. It is recommended that the student first try the assessment without the Reference Chart and then refer to it if needed.

## Student

### OPPOSITES & ABSOLUTE VALUE (LESSON 1)

Find the opposite of each number.

3 \_\_\_\_\_       $-\frac{4}{5}$  \_\_\_\_\_      6.2 \_\_\_\_\_

Find the absolute value of each number.

$|-8| =$  \_\_\_\_\_       $|7.7| =$  \_\_\_\_\_       $|-14| =$  \_\_\_\_\_

Compare the following using  $<$ ,  $>$ , or  $=$ .

$|-26|$  ○  $|26|$                        $|-32|$  ○  $|-36|$

## Additional Practice

### OPPOSITES & ABSOLUTE VALUE

The numbers 5 and  $-5$  are opposites.

Absolute values are never negative.  $|-2| = 2$

Complete the chart.

Number	Opposite	Absolute Value
9		
$-\frac{3}{4}$		
-18.02		
$7\frac{1}{6}$		

**PRIME FACTORIZATION & GREATEST COMMON FACTORS (LESSONS 2 & 3)**

Use a factor tree to find the prime factorization of 150.

$$\begin{array}{c} 150 \\ / \quad \backslash \end{array}$$

\_\_\_\_\_

Find the prime factorization of each number. Then find the GCF of the numbers.

30: \_\_\_\_\_ GCF: \_\_\_\_\_  
 24: \_\_\_\_\_

**FRACTIONS (LESSONS 4 & 5)**

Write the fractions in order from least to greatest in simplest form.

$$\frac{6}{12}, \frac{3}{8}, \frac{8}{15} \quad \underline{\hspace{2cm}}$$

Complete the chart.

Improper Fractions	Mixed or Whole Numbers
$\frac{23}{4}$	
	$5\frac{3}{7}$
$\frac{108}{9}$	

**Additional Practice**

**PRIME FACTORIZATION & GREATEST COMMON FACTORS**

Separate each composite number into a factor pair until every factor is a prime number.

Find the prime factorization of each number. Then find the GCF of the numbers.

27: \_\_\_\_\_ GCF: \_\_\_\_\_  
 45: \_\_\_\_\_

**Additional Practice**

**FRACTIONS**

Simplify a fraction by dividing its numerator and denominator by the same whole number.

Write the fractions in order from least to greatest in simplest form.

$$\frac{5}{7}, \frac{8}{16}, \frac{10}{30} \quad \underline{\hspace{2cm}}$$

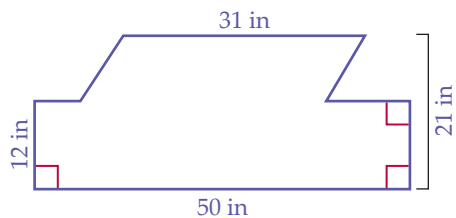
Match the improper fractions and whole or mixed numbers.

$\frac{15}{3}$	$7\frac{1}{11}$
$\frac{24}{5}$	5
$\frac{78}{11}$	$4\frac{4}{5}$
$\frac{12}{5}$	$2\frac{2}{5}$

**TRIANGLES, PARALLELOGRAMS, TRAPEZOIDS, NETS & SURFACE AREA, PERIMETER & AREA OF IRREGULAR FIGURES** (LESSONS 6, 7, 21, 22)

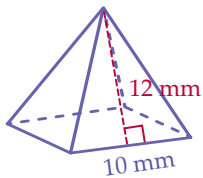
Draw an isosceles right triangle.

Find the area of the figure.



$A = \underline{\hspace{2cm}}$

Find the surface area of the square pyramid.



$SA = \underline{\hspace{2cm}}$

**LEAST COMMON MULTIPLES (LCM)** (LESSON 8)

Find the LCM of the numbers.

6: \_\_\_\_\_

9: \_\_\_\_\_

12: \_\_\_\_\_

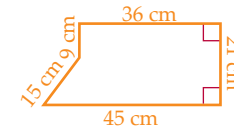
LCM of 6, 9, and 12: \_\_\_\_\_

**Additional Practice**

**TRIANGLES, PARALLELOGRAMS, TRAPEZOIDS, NETS & SURFACE AREA, PERIMETER & AREA OF IRREGULAR FIGURES**

Properties of triangles and area formulas are listed on the Reference Chart.

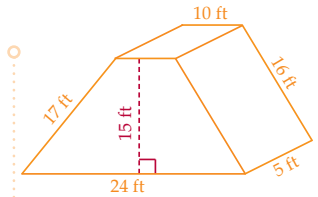
Draw a scalene obtuse triangle.



Find the area and perimeter of the figure.

$A = \underline{\hspace{2cm}}$

$P = \underline{\hspace{2cm}}$



Find the surface area of the trapezoidal prism.

$SA = \underline{\hspace{2cm}}$

**Additional Practice**

**LEAST COMMON MULTIPLES (LCM)**

List multiples of each number or use prime factorization.

Find the LCM of the numbers.

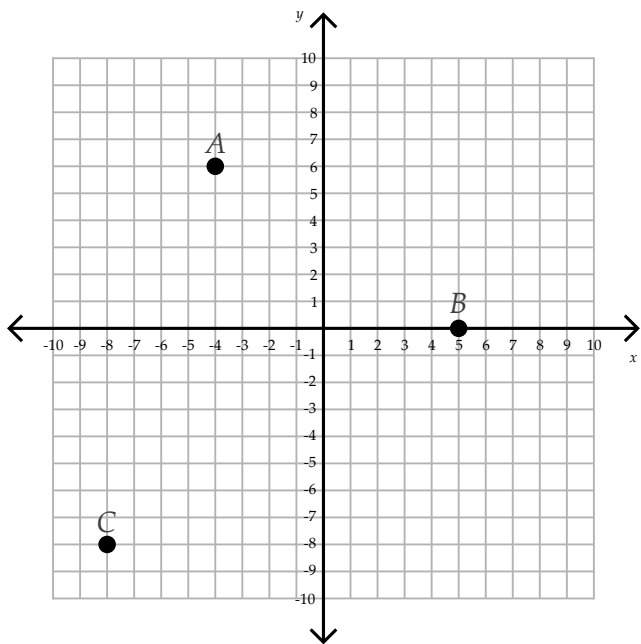
20: \_\_\_\_\_

10: \_\_\_\_\_

15: \_\_\_\_\_

LCM of 20, 10, and 15: \_\_\_\_\_

# COORDINATE PLANES (LESSON 27)



Write the coordinates of each point.

Point A: \_\_\_\_\_ Point B: \_\_\_\_\_ Point C: \_\_\_\_\_

Plot and label each point. Then write the quadrant where that point is located.

Point D:  $(7, -5)$  quadrant \_\_\_\_\_

Point E:  $(-9, 9)$  quadrant \_\_\_\_\_

Point F:  $(-3, -5)$  quadrant \_\_\_\_\_

Point G:  $(7, 6)$  quadrant \_\_\_\_\_

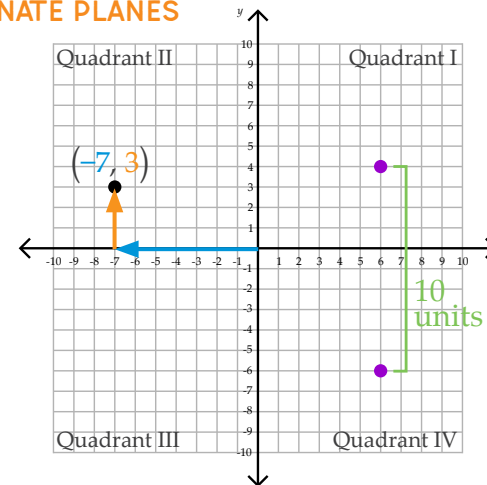
What is the distance between Point D and Point F? \_\_\_\_\_

What is the distance between Point G and Point D? \_\_\_\_\_

## Additional Practice

### COORDINATE PLANES

The first number in an ordered pair gives the **horizontal position**. The second number gives the **vertical position**.



Write the coordinates of each point below.

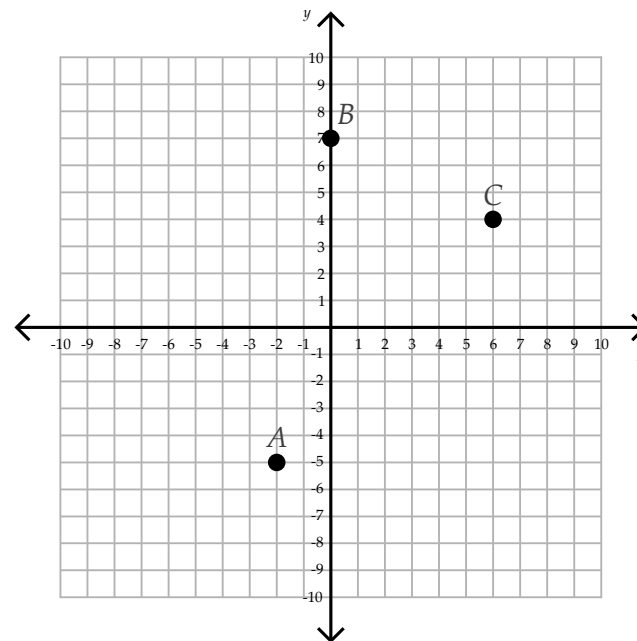
Point A: \_\_\_\_\_ Point B: \_\_\_\_\_ Point C: \_\_\_\_\_

Plot and label each point. Then write the quadrant where that point is located.

Point D:  $(4, -9)$  quadrant \_\_\_\_\_

Point E:  $(-8, -9)$  quadrant \_\_\_\_\_

What is the distance between Point D and Point E? \_\_\_\_\_



# UNIT 2 OVERVIEW

## LESSONS 31-60

### Extra Supplies Needed

- colored pencils
- protractor
- ruler

### New Concepts Taught

- addition and subtraction of integers
- adjacent angles
- area and perimeter of a semicircle
- central angles
- coefficients, constants, terms, and variables in expressions
- complementary and supplementary angles
- complex fractions
- convert between turns and degrees
- cube roots
- decimal percentages
- distance between two points on a coordinate plane
- equations with decimals and fractions
- evaluate expressions with exponents, fractions, and negative numbers
- evaluate expressions with more than one variable
- factor an expression
- find the percent when the whole and a part are known
- find the whole when the percent and a part are known
- identify and combine like terms
- missing angle measures in triangles and quadrilaterals
- multiple transformations on a coordinate plane
- multiplication and division of integers
- names of quadrants on a coordinate plane
- one-step equations with addition and subtraction
- one-step equations with multiplication and division
- parts of a circle: central angles and chords
- percent problems with fractions
- sum of the interior angle measures of a quadrilateral
- sum of the interior angle measures of a triangle

### Concepts Reviewed and Expanded Upon

- angle classification
- area and circumference of a circle
- check solutions
- differences between an equation and an expression
- distributive property
- graph in all four quadrants
- measure and construct angles using a protractor
- name geometric figures with symbols and letters
- percent of a number
- pi
- polygons and other geometric figures
- quadrilateral classification
- radius and diameter
- reflectional, translational, and rotational symmetry
- square roots
- transformations on a coordinate plane
- volume of a cube



MEASURING & CONSTRUCTING  
ANGLES / COMPLEMENTARY  
& SUPPLEMENTARY ANGLES

Supplies  
protractor  
colored pencils

Watch the video lesson and/or read the mini lesson.

Warm-Up

Mark an acute angle with a single arc and an obtuse angle with a double arc.



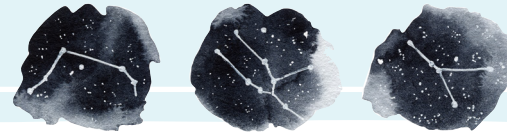
Video Lesson

Scan the QR code or watch the video lesson on [goodandbeautiful.com/Math6](http://goodandbeautiful.com/Math6).



$m\angle A = 45^\circ$  \_\_\_\_\_

$m\angle C = 125^\circ$  \_\_\_\_\_



Mental Math Checkup

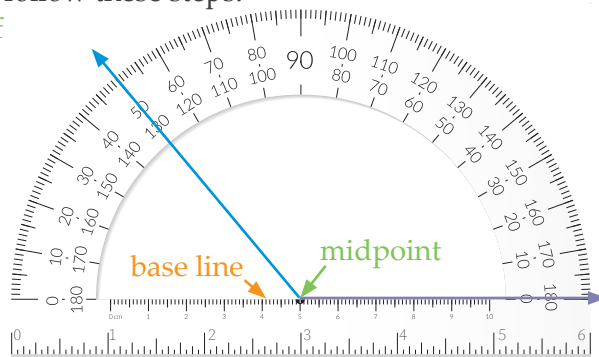
1. Evaluate the following.  
 $9^2 + 3^2 =$
2. What is  $\frac{1}{5}$  of 10?
3. Start at 12. Perform each operation in the following order:  
 $-2, +5, \div 3, \times 10, \div 2$

## Mini Lesson

A **protractor** is a tool for measuring and drawing angles.

To MEASURE an angle, follow these steps:

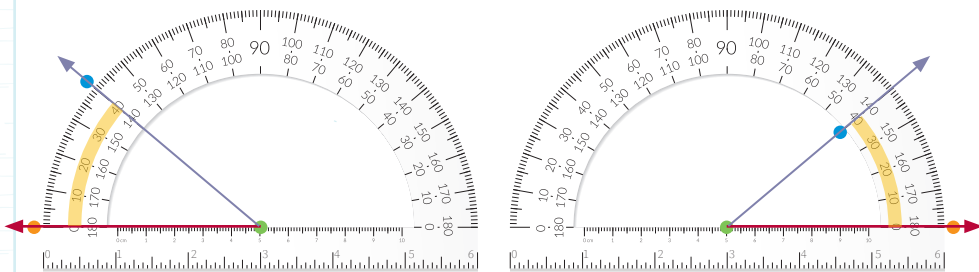
1. Place the midpoint of the protractor on the vertex of the angle.
2. Line up one side of the angle with the base line on the protractor.
3. Read the degrees where the other side of the angle crosses the number scale. Make sure to read the correct scale.



The angle above measures  $130^\circ$ .

To DRAW an angle, follow these steps:

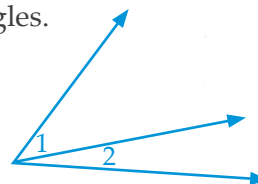
1. Draw a point at the midpoint of the protractor.
2. Draw another point at  $0^\circ$ .
3. Connect the points with a ray.
4. Draw a point to mark the degree of the angle. Make sure to read the correct number scale. This example shows a  $40^\circ$  angle.
5. Draw a ray by connecting the point at the midpoint with the point marking the degrees.



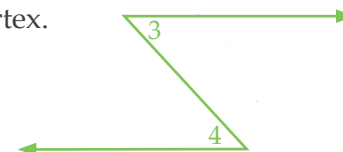
Notice that an angle can be drawn using either scale (highlighted in yellow) on a protractor.

**Adjacent angles** are two angles that have the same vertex and a common side.

Angles 1 and 2 are adjacent angles.

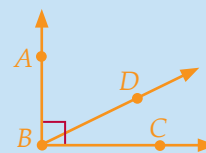


Angles 3 and 4 are not adjacent. They do not have a common vertex.

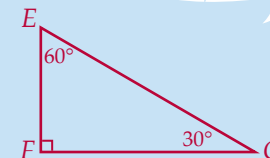


**Complementary angles** are two angles whose sum is  $90^\circ$ . When complementary angles are adjacent, they form a right angle. Angles do not have to be adjacent to be complementary.

Adding angles is really adding the measures of those angles.

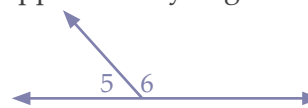


In this figure,  $\angle ABD$  and  $\angle DBC$  are complementary angles because together they form a  $90^\circ$  angle.

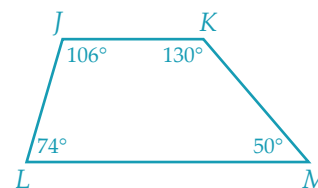


In this figure,  $\angle E$  and  $\angle G$  are complementary angles because  $60^\circ + 30^\circ = 90^\circ$ ;  $\angle E$  is the complement of  $\angle G$ , and  $\angle G$  is the complement of  $\angle E$ .

**Supplementary angles** are two angles whose sum is  $180^\circ$ . When supplementary angles are adjacent, they form a straight line.



In the top figure,  $\angle 5$  and  $\angle 6$  are supplementary angles because together they form a line, which measures  $180^\circ$ .



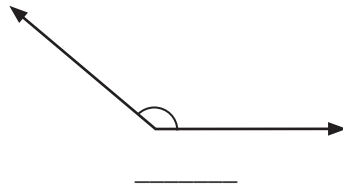
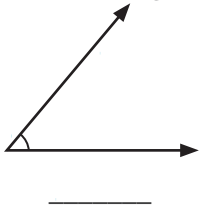
In this trapezoid,  $\angle J$  and  $\angle L$  are supplementary angles. The supplement of  $\angle J$  is  $\angle L$ ; the sum of their angle measures is  $180^\circ$ .  $\angle K$  and  $\angle M$  are also supplementary angles.

Practice

Hint: You can extend a side to make it easier to measure.



1. Measure each angle.

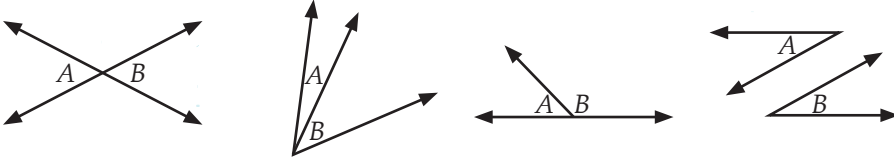


2. Draw each angle using the measure given.

35°

100°

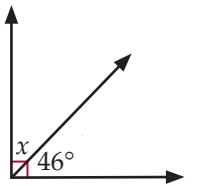
3. Circle each image where  $\angle A$  and  $\angle B$  are adjacent angles.



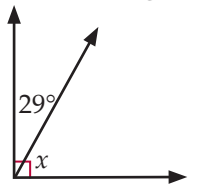
4. Find the complementary angle measures. The first one is given as an example.

40° 50°      30° \_\_\_\_\_      80° \_\_\_\_\_  
 72° \_\_\_\_\_      16° \_\_\_\_\_      53° \_\_\_\_\_

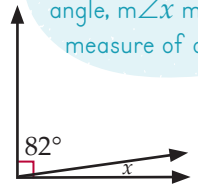
5. Find the measure of  $\angle x$  in each right angle.



$m\angle x =$  \_\_\_\_\_



$m\angle x =$  \_\_\_\_\_

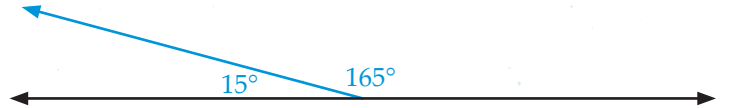


$m\angle x =$  \_\_\_\_\_

When writing a degree measure for an angle,  $m\angle x$  means "the measure of angle  $x$ ."

6. Draw a ray to create supplementary angles with the measures given. The first one is given as an example.

15° and 165°



120° and 60°

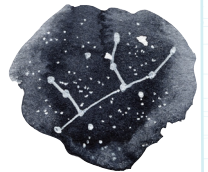


85° and 95°

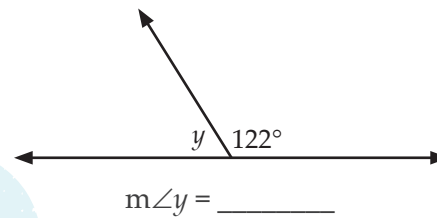


7. Find the supplementary angle measures.

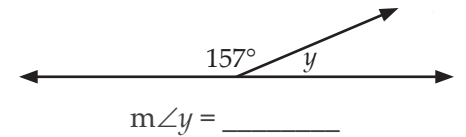
142° \_\_\_\_\_      25° \_\_\_\_\_      105° \_\_\_\_\_  
 18° \_\_\_\_\_      167° \_\_\_\_\_      32° \_\_\_\_\_



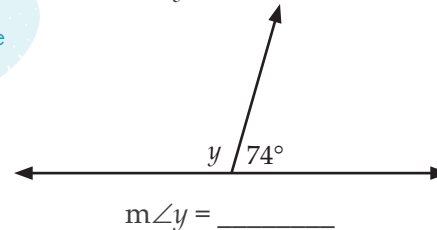
8. Find the measure of  $\angle y$  in each straight angle.



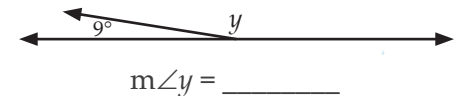
$m\angle y =$  \_\_\_\_\_



$m\angle y =$  \_\_\_\_\_



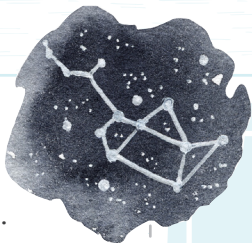
$m\angle y =$  \_\_\_\_\_



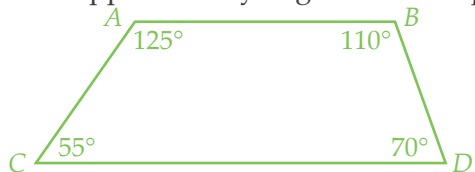
$m\angle y =$  \_\_\_\_\_



**Practice**



9. Find each pair of supplementary angles in the trapezoid.



\_\_\_\_\_ & \_\_\_\_\_                      \_\_\_\_\_ & \_\_\_\_\_

**10. SEEK AND CIRCLE!**

Angle measures are listed below. Circle **complementary angle measures in green** and **supplementary angle measures in red**. The pairs of angles can be horizontal, vertical, or diagonal. An example is given.

5°	80°	8°	34°
100°	85°	91°	115°
65°	102°	157°	23°
41°	49°	61°	14°
130°	24°	135°	76°
74°	50°	45°	59°
121°	52°	38°	133°
163°	17°	54°	75°
3°	87°	18°	105°

★ Hint: Circle 5 pairs of complementary angles and 5 pairs of supplementary angles.

**Review**

1. Evaluate the expression. [Lesson 20](#)

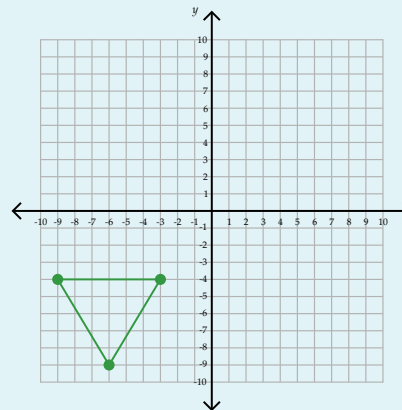
$$200 - 11 \cdot 12 + 6^2 \div 4 + (14 - 9)$$

\_\_\_\_\_

2. Evaluate the expression  $a + b^2 - 3$  when  $a = 2.5$  and  $b = 4$ .  
[Lesson 35](#)

\_\_\_\_\_

3. Reflect the triangle over the  $y$ -axis. Then translate it 3 units up. [Lesson 36](#)



Write the coordinates of the final figure.

\_\_\_\_\_

4. Classify each angle by its degree measure. Write A for acute, R for right, O for obtuse, and S for straight. [Lesson 37](#)

90° \_\_\_\_\_      106° \_\_\_\_\_      180° \_\_\_\_\_      56° \_\_\_\_\_

# ARCHES National Park PUZZLES

There is no video or review for this lesson.

Complete the three puzzles.

Arches National Park is located in southeastern Utah, USA. There are more than 2,000 arches in the park. The exact number changes as new arches are discovered and others fall.

**1** **FOUR FAMILIES** visited Arches National Park, and each family hiked a different trail. Find out which family hiked which trail and the distance they hiked by solving the logic puzzle on the right. Note that these hike distances are actual round-trip distances.

- The Taylor family did not hike to Tower Arch.
- The Wang family hiked the farthest.
- The Garcia family hiked farther than the Taylor family.
- The Hansen family includes a toddler, so they hiked less than one mile.
- The Park Avenue trail is one mile each way.
- The Tower Arch trail is shorter than the Delicate Arch trail but longer than the Park Avenue trail.

		Hike Distance				Trail			
		0.4 miles	2 miles	2.6 miles	3 miles	DELICATE ARCH	SKYLINE ARCH	PARK AVENUE	TOWER ARCH
Family	Taylor								
	Wang								
	Garcia								
	Hansen								
Trail	DELICATE ARCH								
	SKYLINE ARCH								
	PARK AVENUE								
	TOWER ARCH								

Hint: Put an X in a box if it can be ruled out and a ✓ in a box if you are sure of an answer.

**2** FIND THE NUMERIC VALUE of each animal found in Arches National Park. Note that this puzzle may require some guess and check. Use what you know and keep trying different combinations of numbers!

$$\text{Frog} \div \text{Pigeon} = \text{Frog}$$

$$\text{Mouse} + \text{Pigeon} + \text{Mouse} = 33$$

$$\text{Frog} + \text{Deer} = 27$$

$$\text{Deer} - \text{Frog} = 3$$

You will know you are correct if your solutions make the following equation true.

$$\text{Frog} + \text{Pigeon} \cdot \text{Deer} - \sqrt{\text{Mouse}} = 23$$

**3** THE MOHAMED FAMILY is fortunate to live within driving distance of Arches National Park. They have set aside three Saturdays in June for hiking in the park, and their goal is to hike 15 miles that month. Using the numbers 1–4 and 6–9 exactly once, complete the puzzle to find four combinations of three hike lengths that would total 15 miles. In other words, each line of numbers should add up to 15. The center number is given for you.



# SOLVING EQUATIONS WITH DECIMALS & FRACTIONS

▶ Watch the video lesson and/or read the mini lesson.

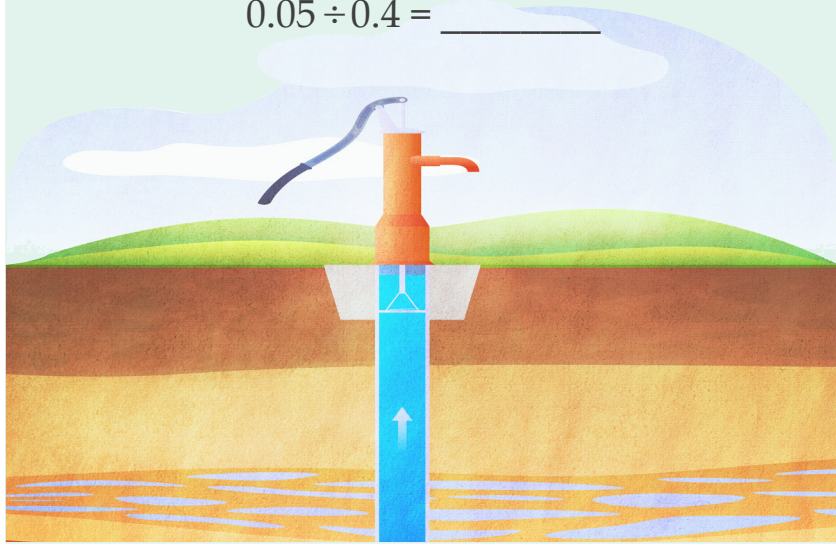
## Warm-Up

Complete the following problems.

$$0.05 + 0.4 = \underline{\hspace{2cm}}$$

$$0.05 \cdot 0.4 = \underline{\hspace{2cm}}$$

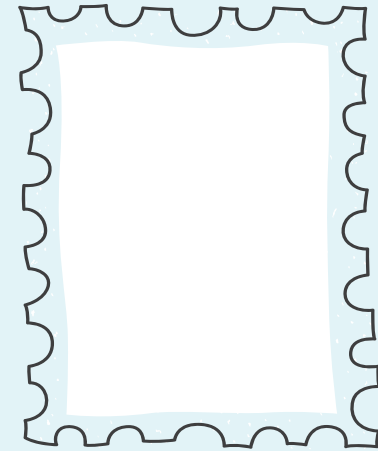
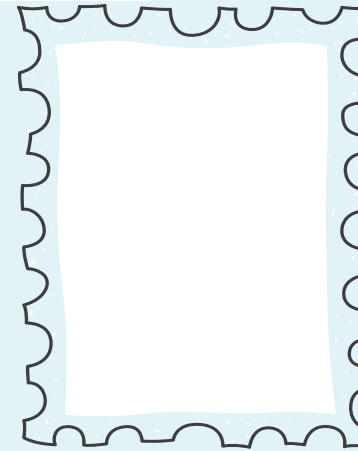
$$0.05 \div 0.4 = \underline{\hspace{2cm}}$$



## Video Lesson



Scan the QR code or watch the video lesson on [goodandbeautiful.com/Math6](http://goodandbeautiful.com/Math6).



## Mental Math Checkup

1. Evaluate the following.

$$\sqrt{81} = \square \quad \sqrt{16} = \square$$

2. Fill in the missing operations that make the equation true.

$$3 \square 8 = 6 \square 4$$

3. Start at 0. Perform each operation in the following order:

$$\times 12, +9, \times 3, +3, \div 5 \quad \square$$

## Mini Lesson

### Solving Equations with Decimals

Solving equations with decimals is similar to solving equations with whole numbers. Just remember a few decimal rules:

Add/Subtract line up the decimal points	Multiply multiply, then count decimal places	Divide move the decimal point in the divisor & dividend
---	--	---

$$\begin{array}{r} 0.03 \\ + 0.20 \\ \hline 0.23 \end{array}$$

$$\begin{array}{r} 0.03 \\ \times 0.2 \\ \hline 0.006 \end{array}$$

$$0.2 \overline{)0.03} \rightarrow 2 \overline{)0.30}$$



### Examples of Equations with Decimals

$$x + 4.2 = 5$$

$$\begin{array}{r} x + 4.2 = 5.0 \\ - 4.2 \quad - 4.2 \\ \hline x = 0.8 \end{array}$$

$$5.6 + x = 8.72$$

$$\begin{array}{r} 5.6 + x = 8.72 \\ - 5.6 \quad - 5.60 \\ \hline x = 3.12 \end{array}$$

$$3.2x = 4$$

$$\begin{array}{r} 3.2x = 4 \\ \cancel{3.2} \quad \cancel{3.2} \\ \hline 3.2 \end{array}$$

scratch work

$$\begin{array}{r} 3.2 \overline{)4.0} \\ \phantom{3.2} \underline{1.25} \\ 32 \overline{)40.00} \end{array}$$

$$x = 1.25$$

$$5x = 4.5$$

$$\begin{array}{r} 5x = 4.5 \\ \cancel{5} \quad \cancel{5} \\ \hline 5 \end{array}$$

scratch work

$$\begin{array}{r} 0.9 \\ 5 \overline{)4.5} \end{array}$$

$$x = 0.9$$

$$\frac{x}{1.2} = 8$$

$$\begin{array}{r} 1.2 \cdot \frac{x}{1.2} = 8 \cdot 1.2 \end{array}$$

scratch work

$$\begin{array}{r} 1 \\ 1.2 \\ \times 8 \\ \hline 9.6 \end{array}$$

$$x = 9.6$$

### Solving Equations with Fractions

When a coefficient is a fraction, multiply the coefficient by its reciprocal to isolate the variable. Then multiply the other side by the same number.

Example:

$$\frac{2}{3}x = 4$$

Multiply by the reciprocal of the coefficient.

$$\frac{3}{2} \cdot \frac{2}{3}x = \frac{3}{1} \cdot \frac{3}{1}$$

Cancel first; then multiply.

$$x = \frac{6}{1}$$

Simplify the fraction.

$$x = 6$$

A number multiplied by its reciprocal is 1.

### Additional Examples of Equations with Fractions

$$x + \frac{1}{4} = \frac{2}{3}$$

$$\begin{array}{r} x + \frac{1}{4} = \frac{2}{3} \\ - \frac{1}{4} \quad - \frac{1}{4} \\ \hline x = \frac{5}{12} \end{array}$$

$$x = \frac{2}{3} - \frac{1}{4}$$

$$x = \frac{8}{12} - \frac{3}{12}$$

$$x = \frac{5}{12}$$

$$x - 6 = \frac{3}{5}$$

$$\begin{array}{r} x - 6 = \frac{3}{5} \\ + 6 \quad + 6 \\ \hline x = \frac{3}{5} + 6 \end{array}$$

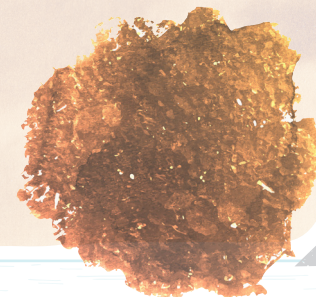
$$x = \frac{3}{5} + 6$$

$$x = 6\frac{3}{5}$$

$$\frac{3}{4}x = \frac{5}{8}$$

$$\begin{array}{r} \frac{4}{3} \cdot \frac{3}{4}x = \frac{5}{8} \cdot \frac{4}{3} \\ \hline x = \frac{5}{2} \end{array}$$

$$x = \frac{5}{2}$$





# DE DECIMALS P

Find the value of each variable.

$$h - 1.4 = 3$$

$$h = \underline{\quad}$$

$$3.1 + f = 4.5$$

$$f = \underline{\quad}$$

$$8.02 = g + 7.3$$

$$g = \underline{\quad}$$

$$j - 1.63 = 7$$

$$j = \underline{\quad}$$

$$2c = 5$$

$$c = \underline{\quad}$$

$$4b = 5.28$$

$$b = \underline{\quad}$$

$$20 = 2.5d$$

$$d = \underline{\quad}$$

$$12 = 0.8a$$

$$a = \underline{\quad}$$

$$\frac{p}{5} = 1.4$$

$$p = \underline{\quad}$$

$$10 = \frac{m}{2.2}$$

$$m = \underline{\quad}$$

$$\frac{n}{6} = 3.6$$

$$n = \underline{\quad}$$

$$\frac{q}{4.2} = 2.5$$

$$q = \underline{\quad}$$

$$\frac{3}{4}w = 6$$

$$w = \underline{\quad}$$

$$\frac{2}{3}z = \frac{1}{3}$$

$$z = \underline{\quad}$$

$$2 = \frac{4}{5}x$$

$$x = \underline{\quad}$$

$$\frac{7}{9}y = \frac{14}{3}$$

$$y = \underline{\quad}$$

$$s - \frac{5}{8} = 9$$

$$s = \underline{\quad}$$

$$u + \frac{1}{3} = \frac{7}{6}$$

$$u = \underline{\quad}$$

$$t - 4 = \frac{2}{9}$$

$$t = \underline{\quad}$$

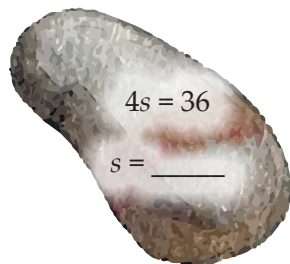
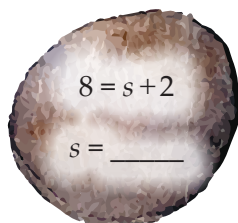
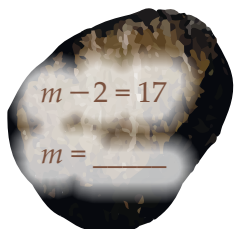
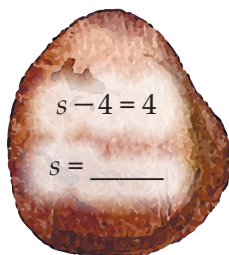
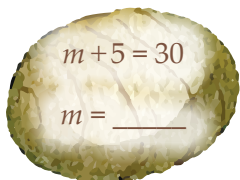
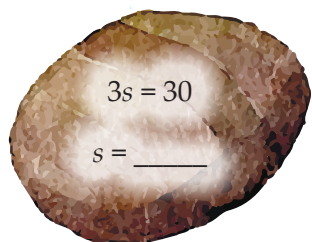
$$\frac{2}{3} + v = \frac{4}{5}$$

$$v = \underline{\quad}$$

# Rock Equations

## Practice

The earth's crust is thickest beneath mountains in the Himalayas and thinnest in the ocean. Solve the equations on the rocks to find the average thickness of the crust below land and below the ocean.



The crust below land is about            km (           mi) thick.  
largest value of  $m$     smallest value of  $m$

The crust below the ocean is about            km (           mi) thick.  
largest value of  $s$     smallest value of  $s$

## Review

- Nico had 54 baseball trading cards. He was given  $c$  trading cards for Christmas. Write an expression that shows how many trading cards Nico has now. [Lesson 34](#)
- On the first line, substitute the given values in place of the variables. On the second line, evaluate the expression. [Lesson 35](#)  
 $a^2 - 2b + 7$      $a = 5, b = 11$     \_\_\_\_\_  
\_\_\_\_\_
- Factor each expression. [Lesson 48](#)  
 $8 + 12 =$      $10 + 75 =$
- Lola made  $n$  cupcakes for a bake sale. She sold 19 cupcakes and has 16 left to sell. Write and solve an equation to find the number of cupcakes Lola made. [Lesson 49](#)

- Solve each equation. [Lesson 50](#)

$9a = 81$

$11b = 132$

$65 = 5c$

$a = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

$c = \underline{\hspace{2cm}}$

UNIT 2  
REVIEW

Poetry can be a beautiful representation of many parts of life. Robert Frost wrote a poem titled “The Road Not Taken” in 1915. Follow the roads and complete the problems to review the concepts taught in Unit 2. Then enjoy the poem at the end!

PERCENTS Lessons 44, 52–55

Find the percent of each number.

What is 20% of 40? \_\_\_\_\_

What is 125% of 8? \_\_\_\_\_

What is 30% of 7.5? \_\_\_\_\_

What is 60% of  $\frac{3}{4}$ ? \_\_\_\_\_

Find each whole.

30% of what number is 15? \_\_\_\_\_

Find each percent.

What percent of 82 is 41? \_\_\_\_\_

55 is 20% of what number? \_\_\_\_\_

45 is what percent of 150? \_\_\_\_\_

SOLVING EQUATIONS Lessons 43, 49–51

Solve each equation.

$$a - 2.5 = 4.25$$

$$22 = b + 5$$

$$3c = 36$$

$$\frac{2}{5}d = 8$$

See  
Reference  
Chart for rules  
for operations  
with integers.

ADDITION, SUBTRACTION,  
MULTIPLICATION & DIVISION OF INTEGERS

Lessons 31 & 32

Complete each problem.

$$15 - (-3) = \underline{\hspace{2cm}}$$

$$-21 + 7 = \underline{\hspace{2cm}}$$

$$5(-6) = \underline{\hspace{2cm}}$$

$$-72 \div 9 = \underline{\hspace{2cm}}$$

EXPRESSIONS Lesson 35

Evaluate each expression using the values given.

$$a = 3, b = \frac{3}{4}, c = 4.2$$

$$a^2 - 4b + c \underline{\hspace{2cm}}$$

$$3c + a - 8b \underline{\hspace{2cm}}$$

**DISTRIBUTIVE PROPERTY & FACTORING** Lessons 47 & 48

Write the second factor in expanded form, and then use the distributive property to multiply.

$3 \cdot 821 =$

$7 \cdot 1,028 =$

Factor each expression.

$9 + 63 =$

$24 + 18 =$

$75 + 15 =$

**SQUARE ROOTS, CUBE ROOTS & COMBINING LIKE TERMS** Lessons 33 & 46

Complete each problem.

$\sqrt{144} - \sqrt[3]{64} = \underline{\hspace{2cm}}$

$\sqrt[3]{125} + \sqrt{100} = \underline{\hspace{2cm}}$

$\sqrt{121} \cdot \sqrt[3]{8} = \underline{\hspace{2cm}}$

Cross out the statements that are not true.

$3a + 8b + 2a = 5a + 8b$

$4x - y = 3xy$

$2r + 4r^2 = 6r$

$5m + 4n - n = 5m + 3n$

**COMPLEX FRACTIONS** Lesson 56

Simplify the complex fractions.

$\frac{1\frac{3}{4}}{\frac{1}{2}} =$

$\frac{\frac{2}{3}}{4} =$

$\frac{\frac{1}{4}}{\frac{5}{8}} =$

**COMPLEMENTARY & SUPPLEMENTARY ANGLES** Lesson 38

Find the complementary angle measures.

$63^\circ \underline{\hspace{1cm}}$

$18^\circ \underline{\hspace{1cm}}$

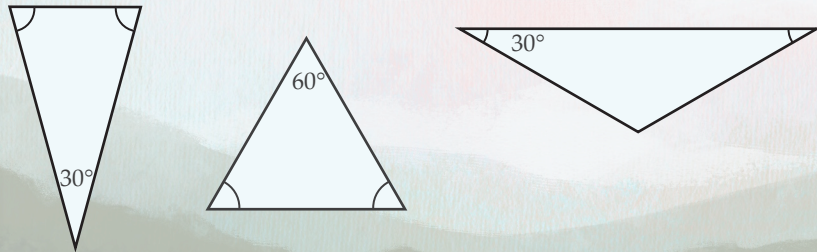
Find the supplementary angle measures.

$20^\circ \underline{\hspace{1cm}}$

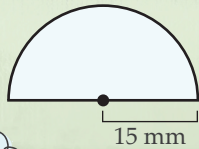
$145^\circ \underline{\hspace{1cm}}$

**SYMMETRY, TRIANGLES & SEMICIRCLES** Lessons 36, 39 & 42

Write the missing angle measures on each triangle. Then circle the triangle(s) that have rotational symmetry.



Find the area and perimeter of the semicircle.



$A \approx$  \_\_\_\_\_

$P \approx$  \_\_\_\_\_

See Reference Chart for area & perimeter formulas.

**ANGLES** Lesson 37

Classify each angle as acute (A), right (R), obtuse (O), or straight (S).

$90^\circ$  \_\_\_\_\_

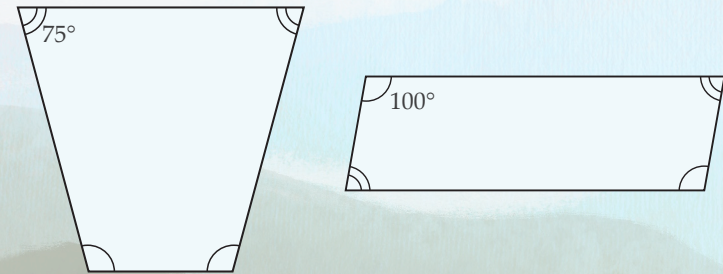
$15^\circ$  \_\_\_\_\_

$173^\circ$  \_\_\_\_\_

$180^\circ$  \_\_\_\_\_

**SYMMETRY & QUADRILATERALS** Lessons 36 & 40

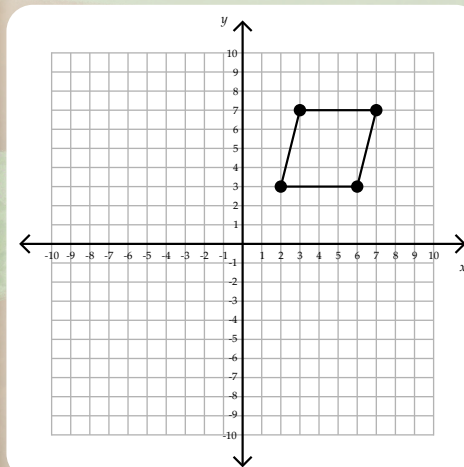
Draw all lines of symmetry on the shapes below. Then write the missing angle measures.



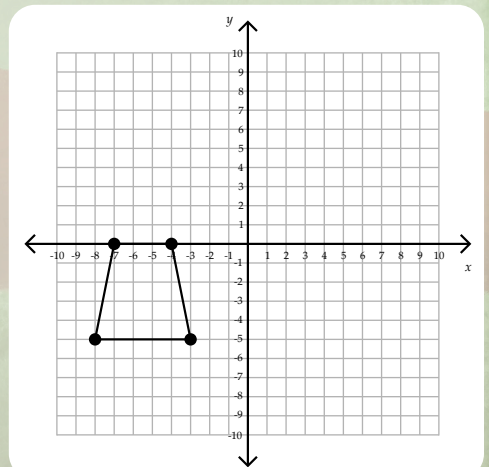
**TRANSFORMATIONS** Lesson 36

Translate each shape according to the information given.

Translate the parallelogram 3 units left and 2 units up. Then reflect it over the  $x$ -axis.

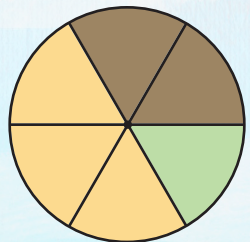


Translate the trapezoid 2 units right and 4 units down. Then reflect it over the  $y$ -axis.



**CIRCLES** Lesson 41

The circle below is divided evenly. Find the measure of the central angle formed by each colored section.



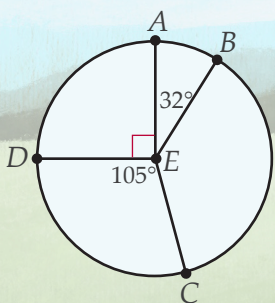
yellow: \_\_\_\_\_

brown: \_\_\_\_\_

green: \_\_\_\_\_

Find the measure of  $\angle BEC$  on  $\odot E$ .

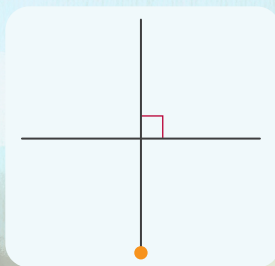
$m\angle BEC =$  \_\_\_\_\_



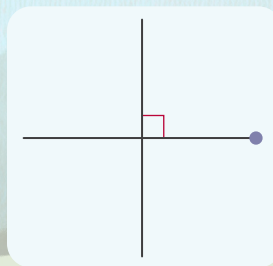
**IDENTIFYING TURNS** Lesson 57

Draw each turn starting at the dot according to the information given.

90° turn  
counterclockwise



270° turn  
clockwise



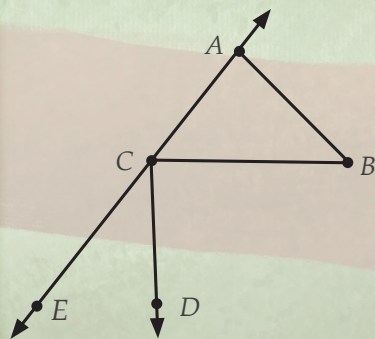
Convert between degrees and turns.

$1\frac{3}{4}$  turns  $\rightarrow$  \_\_\_\_\_

$900^\circ \rightarrow$  \_\_\_\_\_

**GEOMETRIC FIGURES** Lesson 37

Using letters and symbols, write the name of each geometric figure below.



1 line segment:

1 line:

1 ray:

1 triangle:

**THE ROAD NOT TAKEN**

By Robert Frost

Two roads diverged in a yellow wood,  
And sorry I could not travel both  
And be one traveler, long I stood  
And looked down one as far as I could  
To where it bent in the undergrowth;

Then took the other, as just as fair,  
And having perhaps the better claim,  
Because it was grassy and wanted wear;  
Though as for that the passing there  
Had worn them really about the same,

And both that morning equally lay  
In leaves no step had trodden black.  
Oh, I kept the first for another day!  
Yet knowing how way leads on to way,  
I doubted if I should ever come back.

I shall be telling this with a sigh  
Somewhere ages and ages hence:  
Two roads diverged in a wood, and I—  
I took the one less traveled by,  
And that has made all the difference.