Simply Good and Beautiful

MATH 5

COURSE BOOK

The Good and the Beautiful
CURRICULUM

Simply Good and Beautiful MATH 5

COURSE BOOK

Created by the Simply Good and Beautiful Math Team

Reviewed by Deanna Dreher, PhD in mathematics; Tamara Stark, MA in mathematics education;
Nicki Savinda, BS in mathematics with secondary education certification;
Jennifer Christensen, BS in elementary education; Amber Dzubinski, BA in elementary education

The Good and the Beautiful Curriculum
goodandbeautiful.com

Table of Contents

ABOUT THE COURSE

Supplies Needed

- *Simply Good and Beautiful Math 5 Course Book*
- *Simply Good and Beautiful Math 5 Answer Key*
- *Math 5 Mental Math Map Mysteries*
- *Simply Good and Beautiful Math Scratch Pad* or other scratch paper
- Device to access videos (highly recommended)
- Pencils
- Colored pencils
- Scissors
- Protractor
- Standard dice
- Paper clip
- Coin
- Ruler
- 1 index card or cardstock
- Tape

Course Overview

Math 5 consists of 120 lessons divided into four units. Each unit ends with a unit assessment. The course is designed to be completed by the child independently, but parents/teachers can choose to be as involved in the lessons as they would like to be.

Lesson Overview

Most lessons are three pages and consist of four parts: video lesson, mini lesson, practice, and review.

Video Lesson: Themed videos provide detailed teaching and interactive guided practice of the lesson topic. Scan the QR code or go to goodandbeautiful.com/Math5 to access the videos.

Mini Lesson: A concise written lesson on the topic.

Practice: Practice that is dedicated to the lesson topic.

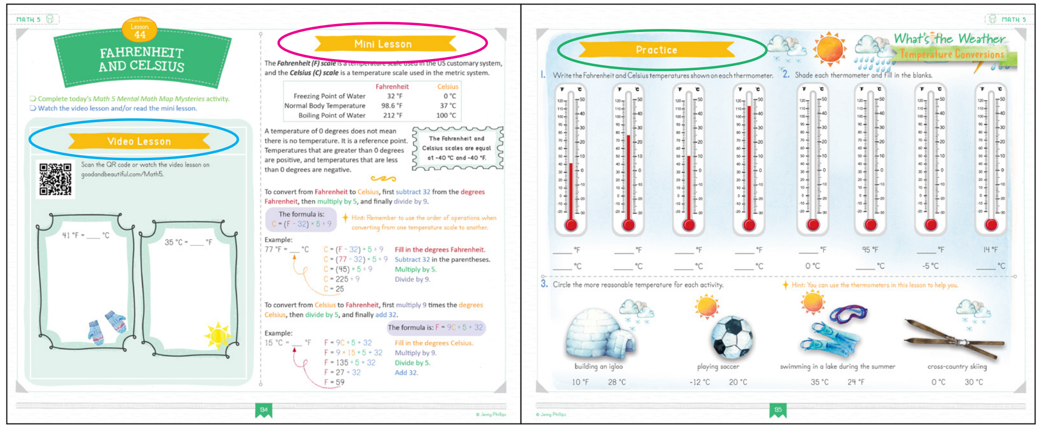
Review: Daily review of topics from previous lessons.

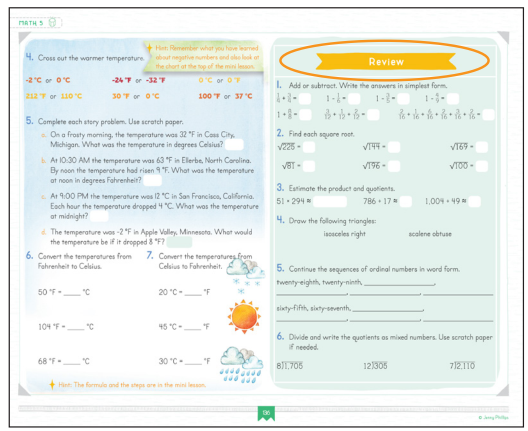
A Reference Guide is included at the end of the course book.

Getting Started

Simply open the course book. Students may choose to watch the video lesson or to 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. After completing the video and/or mini lesson, the student should complete the lesson practice and review sections. Parents/teachers should grade the child'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.

Students should complete one section in their *Math 5 Mental Math Map Mysteries* book each time they complete a math lesson.





Frequently Asked Questions

How many lessons should my student do each week?

- There are 120 lessons in the course. If your 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 35–45 minutes. This includes time to watch the video and complete the practice and review 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. Complete the video and practice at one time and 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. Remember, the first few lessons of the course are review from Math 4, and it's expected that most students will know the information already.

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 5 completed independently by the child?

- Yes, Math 5 is designed for your student to mostly complete independently, though at times children may need parent/teacher assistance to understand a concept. Parents/teachers will need to grade the child's work and should do so on a daily basis when possible, providing immediate feedback.

Is Math 5 a spiral or mastery program?

- Math 5 is mainly 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 5?

- Calculators are not used in this course. By Math 5, students are expected to have their multiplication facts mastered. If they do not, we strongly recommend spending extra time each day to work on this skill as the child may have difficulty until the facts are memorized.

UNIT 1 OVERVIEW

LESSONS 1–30

Extra Supplies Needed

- ruler
- protractor
- colored pencils

New Concepts Taught

- angle measurements with protractors
- divisibility rules for dividing by 3, 4, 6, and 9
- double and triple line graphs
- double bar graphs
- estimation of products and quotients with area
- infinite sequences
- multiplication and division with powers of 10
- order of operations with exponents greater than 2
- ordered pairs on a coordinate grid with four quadrants
- perfect squares to 225
- prime factorization
- square roots

Concepts Reviewed and Expanded Upon

- associative property of multiplication
- divisibility rules for dividing by 2, 5, and 10
- exponents
- geometric figures and solids
- long division with remainders; checking quotients
- mean, median, mode, and range
- missing factors
- number patterns
- positive and negative numbers
- prime and composite numbers
- short division
- similar and congruent shapes
- single line graphs and bar graphs
- units of length conversions
- zero in a quotient

Lesson 3

DIVISIBILITY STRATEGIES

- Complete today's *Math 5 Mental Math Map Mysteries* activity.
- Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math5. The section below is used during the video.

243,201,311,040

2 3 4 5 6 9 10

Mini Lesson

When a number can be evenly divided by another number without a remainder, we say that it is divisible by that number. For example, 15 ÷ 3 = 5 (with no remainder), so 15 is divisible by 3.

Knowing your multiplication facts and using long division can help you find all the factors of a number. You can also use divisibility rules as a strategy to help you find factors quickly.

DIVISIBILITY RULES

DIVISIBLE BY

2 A number is divisible by 2 if it is an even number. Even numbers end in 0, 2, 4, 6, or 8. *(Examples: 2, 56, 214)*

3 A number is divisible by 3 if the sum of the digits is divisible by 3. For example, to check if 231 is divisible by 3, first add the digits. 2 + 3 + 1 = 6. Is 6 divisible by 3? Yes, so 231 is divisible by 3.

4 A number is divisible by 4 if the last two digits of the number are divisible by 4. Look at the last two digits in the number 3,028. Is 28 divisible by 4? Yes, so 3,028 is also divisible by 4.

5 A number is divisible by 5 if it ends in either 0 or 5. *(Examples: 75, 130, 610)*

6 A number is divisible by 6 if it is divisible by both 2 and 3. For example, 312 is an even number, so it is divisible by 2. Now check divisibility by 3. 3 + 1 + 2 = 6. The sum is 6, and it is divisible by 3, so 312 is divisible by 3. Since 312 is divisible by both 2 and 3, it is divisible by 6.

9 A number is divisible by 9 if the sum of the digits is divisible by 9. For example, to check if 576 is divisible by 9, first add the digits. 5 + 7 + 6 = 18. Since 18 is divisible by 9, 576 is also divisible by 9.

10 A number is divisible by 10 if the number ends in 0. *(Examples: 100, 870, and 1,520)*

Do you remember what factors of a number are? They are the whole numbers that can be multiplied together to make the given number.

$$3 \times 8 = 24$$

factors product

A ***factor pair*** is two factors of a number whose product is the given number. Divisibility rules help you find one factor. To find the other factor in that factor pair, divide the number by the factor you already found. The answer to the division problem (the ***quotient***) is the second factor.

For example, 15 is divisible by 3, so one of the factors of 15 is 3. To find the other factor, divide 15 by 3. 15 ÷ 3 = 5. One factor pair is 3 × 5.

Practice

1. Use the strategy of your choice to answer the following questions. Refer to the divisibility rules in the mini lesson as often as you would like.

   a. **Circle** the numbers that are divisible by 3.

   41 90 111 213 1,407 5,123

   b. **Cross out** the numbers that are divisible by 4.

   116 243 332 536 2,020 7,108

   c. **Underline** the numbers that are divisible by 9.

   117 443 621 1,107 3,816 8,010

2. Suppose you collected sticks to build a fort. You can group the sticks into equal piles of 1 or 2 or 3 or 4 or 6 or 12. If these are the only factors of the number of sticks you collected, how many sticks did you collect?

3. Use the strategy of your choice to find all the factor pairs of each of the following numbers. Then write the factors in order from least to greatest. The first one is given as an example.

Number	Factor Pairs	Factors
10	1 × 10, 2 × 5	1, 2, 5, 10
15		
28		
30		
12		
17		

4. Suppose you and your 8 friends collect 189 rocks. Is it possible to divide the rocks equally among all of you?

   Hint: Don't forget to count yourself with your eight friends!

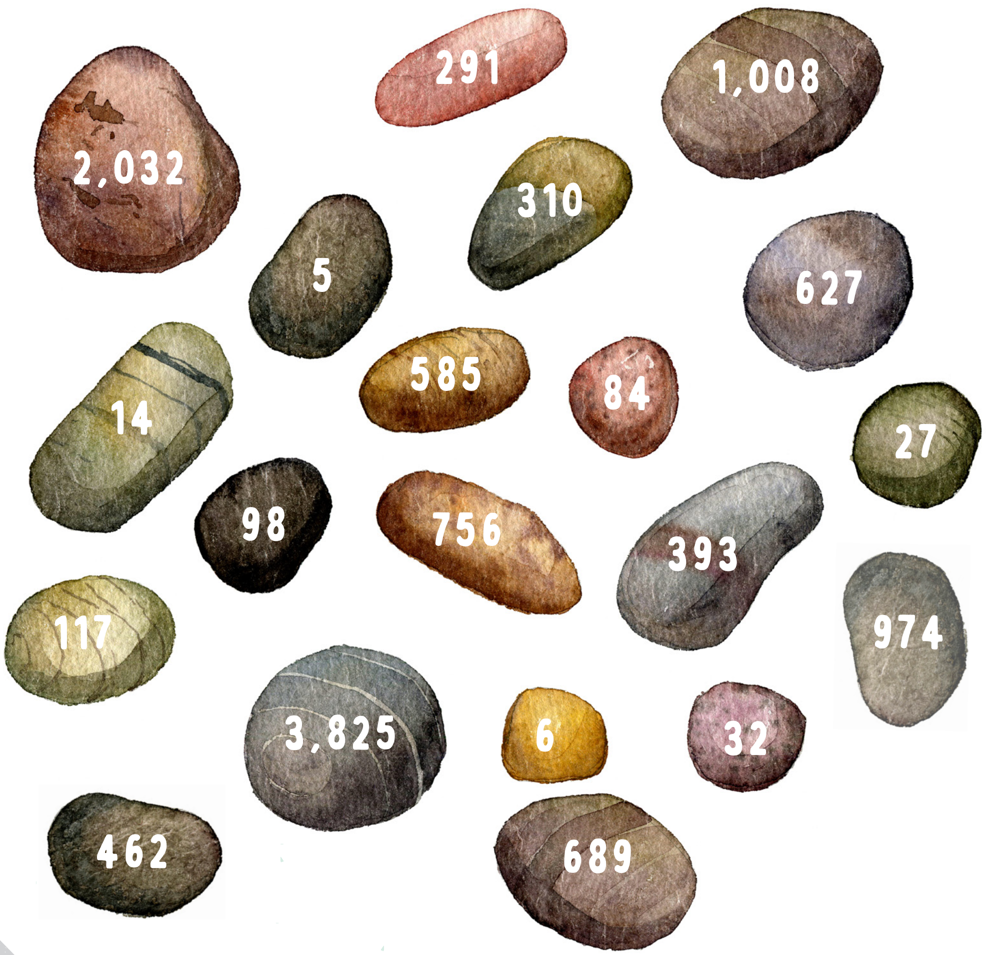
   If you each get an equal share of rocks and leave none behind, how many rocks will each of you get?

5. Solve the puzzle by using the facts below.

- I am greater than 100.
- I am divisible by 3.
- I am not divisible by 5.
- I have fewer than four digits.
- I am not an even number.
- Two of my digits are the same.
- If you divide my second digit by my first digit, you get my last digit.

Try different strategies, such as crossing off the wrong numbers or deciding which clues you want to use first.

WHICH NUMBER AM I?



Review

1. Complete each sequence and state the rule for each pattern. The first rule is given as an example.

72, 81, 90, ____, ____, ____ rule: add 9

156, 144, 132, ____, ____, ____ rule: ____________

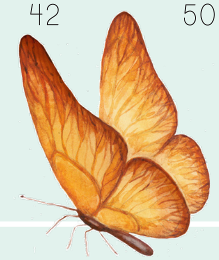
1, 3, 9, ____, ____, ____ rule: ____________

2. Complete the problems.

$$\begin{array}{r} 134 \\ \times \quad 8 \\ \hline \end{array} \qquad \begin{array}{r} 55 \\ \times 48 \\ \hline \end{array} \qquad 7\overline{)175}$$

3. There are equal numbers of dragonflies and butterflies in the meadow. Which of the following numbers could not be the total number of dragonflies and butterflies?

16 28 35 42 50



Lesson 4

PRIME FACTORIZATION

- Complete today's *Math 5 Mental Math Map Mysteries* activity.
- Watch the video lesson and/or read the mini lesson. There is no review.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math5. The section below is used during the video.

Mini Lesson

Let's review! A ***prime number*** is a whole number that has exactly two factors: the number itself and the number 1. ***Factors of a number*** are the whole numbers that can be multiplied together to make the given number. A ***product*** is the answer to a multiplication problem.

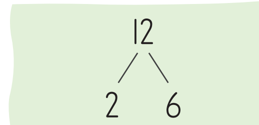
Prime factorization is a number written as the product of its prime factors.

A factor tree can be used to find the prime factors of a number.

Let's make a factor tree for the number 12.

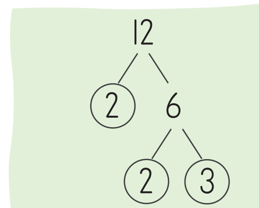
Start by writing the number you are factoring at the top.

Then use lines to separate the number into a factor pair. Do not use 1 and the original number as a factor pair when factoring; choose other factor pairs.



Circle any factors that are prime numbers. If a factor isn't prime, don't circle it.

Keep separating each composite number into factor pairs until every factor is a prime number.

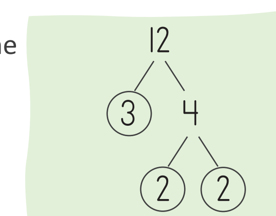


List the prime factors (the circled numbers) as a multiplication problem in order from least to greatest to keep it organized.

The prime factorization of 12 is **2 × 2 × 3**.

To check your work, multiply the prime factors. The product should equal the number you started with.

Here's another way you can make a factor tree for the number 12.



Notice that the answer is still the same: **2** × **2** × **3**.

Each number has a unique prime factorization!

That means one of a kind!

Practice

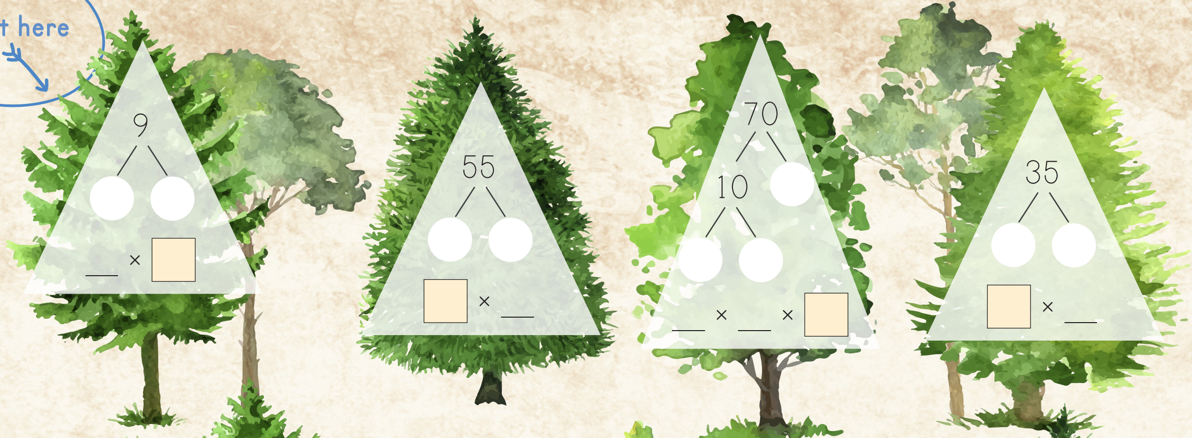
Factorization Forest

Find your way from tree to tree until you get to the cabin! Fill in the prime factorization on the first tree. Then **circle all the prime numbers**. At the bottom of the tree, **list the prime factors in order from least to greatest**. Then determine whether you should go up, down, left, or right to the next tree by using the number in the ☐ and the key below.

☐2 = move right ☐5 = move left

☐3 = move down ☐7 = move up

Start here



You won't have to fill in the prime factorization for all the trees, just for the ones on the path. But you can if you want to!

All done! No review.

Lesson 7

SINGLE, DOUBLE, AND TRIPLE LINE GRAPHS

Supplies
colored pencils

- Complete today's *Math 5 Mental Math Map Mysteries* activity.
- Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math5. The section below is used during the video.

How many miles did Juan bike in the third week? ____________

Juan biked the most miles in week ______.

Times Outside	
Monday	9
Tuesday	7
Wednesday	14

Title: ______________________________

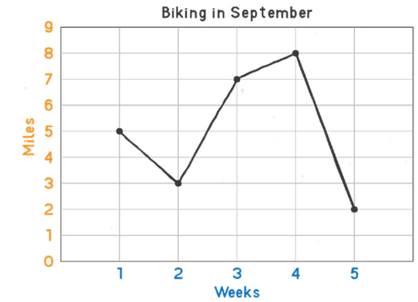
Vertical Axis Label: ______

Horizontal Axis Label: ______________________

Mini Lesson

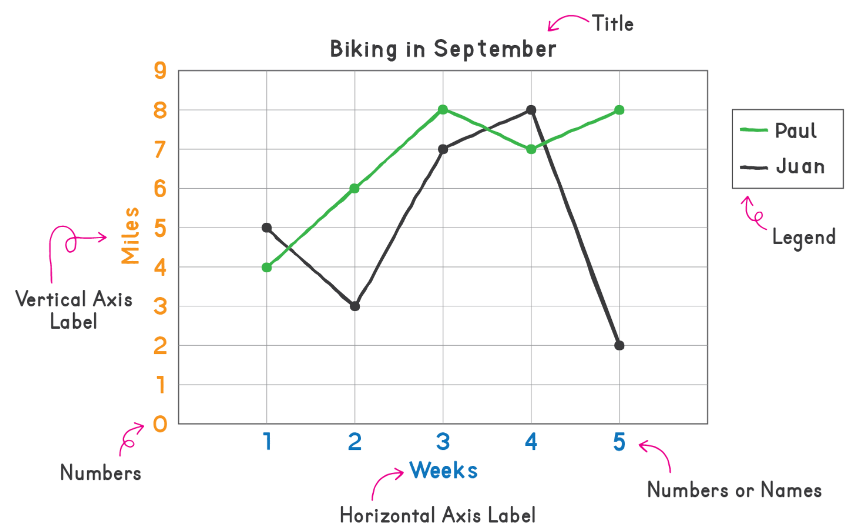
A ***line graph*** is a graph that uses points and line segments to display (or show changes in) data. ***Data*** is a collection of information, such as numbers, measurements, or facts.

On line graphs, each data value is represented by a point on the graph, and the points are connected by line segments. The graph to the right is an example of a line graph.



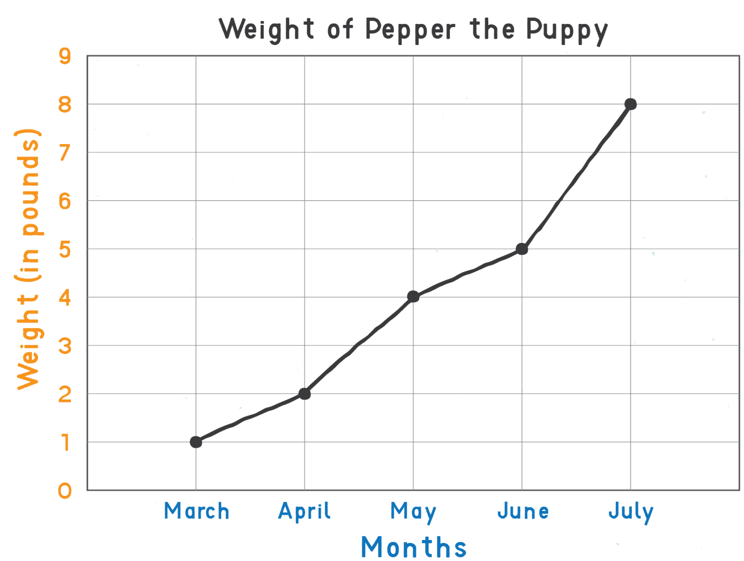
A double line graph shows how two sets of data compare with each other. A triple line graph shows how three sets of data compare with each other. Double line and triple line graphs have one line for each set of data: double line graphs have two lines, and triple line graphs have three lines.

If more than one line is on the graph, each line is usually made with a different color or a different pattern so you can tell them apart. A legend shows what each line represents. This is an example of a double line graph.



Practice

1. Use the line graph "Weight of Pepper the Puppy" to answer the questions.



What unit of weight is used in this graph? ____________
How much did Pepper weigh in March? ____________
How many pounds did Pepper gain from April to July? ____________

2. Create a line graph by using the blank graph to the right and the data below.

For four weeks, Sarah, Luke, and Mia collected leaves.

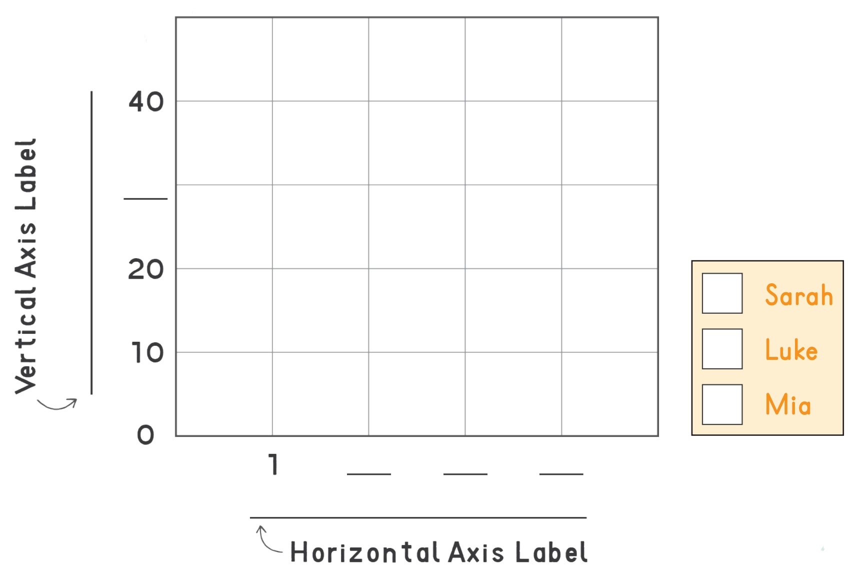
a. Write a title for the graph.
b. Label the horizontal axis "Weeks."
c. Label the vertical axis "Leaves."
d. Fill in the missing numbers on the horizontal axis and the vertical axis.
e. Create a legend in the yellow box by choosing different colors to represent each child.
f. Graph the data for each child.

Hint: Draw the points for one child and connect the points before moving on to the next child.

Week	Sarah	Luke	Mia
1	20	40	30
2	35	20	25
3	15	10	20
4	35	20	40

Who collected the most leaves in week 2? ____________
How many more leaves did Luke collect than Mia in week 1? ____________

Title: ____________________



3. Create your OWN line graph!

a. First, put a pencil on your head. Then record the number of steps you can take without the pencil falling off. Fill in the number of steps in the chart below. You will repeat this for a total of 5 rounds.

b. Write a title at the top of your graph.

c. Label the horizontal axis "Rounds." Write the numbers on the horizontal axis to show rounds 1–5.

d. Label the vertical axis "Steps." In the lower left-hand corner, start with 0 for your numbers. You'll have to decide what number comes next, depending on how many steps you made. Will the numbers go up by 2s? 3s? 5s? You decide! Just make sure each line goes up by the same amount.

e. Draw the points on your graph showing your successful steps for each round.

f. Connect the points with line segments.

Rounds	Steps
1	
2	
3	
4	
5	

Review

1. Find each product.

$72 \times 10^4 =$ ______

$1{,}180 \times 10^5 =$ ______

$2{,}973 \times 10^3 =$ ______

2. Find each quotient.

$42{,}000 \div 10^2 =$ ______

$5{,}050{,}000 \div 10^3 =$ ______

$3{,}000{,}000{,}000 \div 10^7 =$ ______

3. Find each sum.

$5^2 + 2^4 =$ ______ $4^2 + 3^3 =$ ______ $1^8 + 11^2 =$ ______

4. Find each difference.

$8^2 - 2^3 =$ ______ $2^5 - 5^2 =$ ______ $7^2 - 12^0 =$ ______

5. Create a factor tree for 54. Then write the prime factorization for 54 on the line below.

54

/ \

______

Lesson 12

SHORT DIVISION

- Complete today's *Math 5 Mental Math Map Mysteries* activity.
- Watch the video lesson and/or read the mini lesson. There is no review.

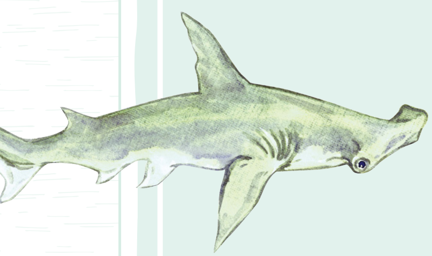
Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math5. This section is used during the video.

$6\overline{)3{,}660}$

$8\overline{)520}$

$3\overline{)55}$



Mini Lesson

Mental math is when you complete math problems in your head. Short division is a method for completing a division problem that uses mental math as you go through the long division steps. You will not write out every step, but you will write down small numbers to help you keep track of the steps as you go.

Example 1:

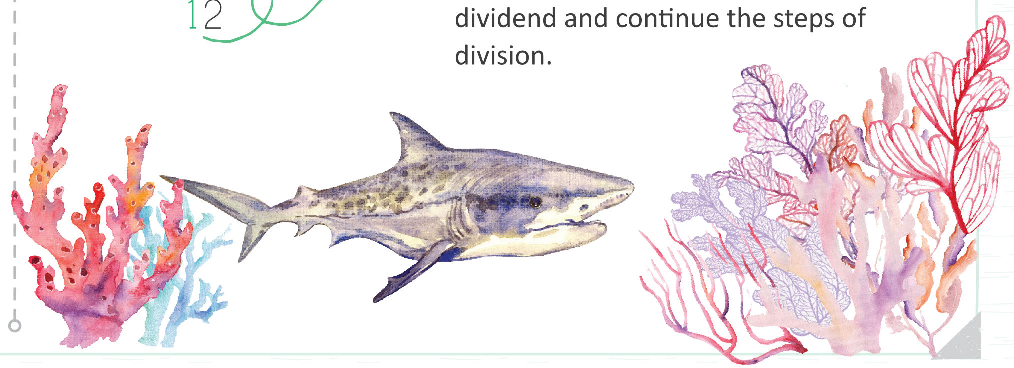
$$\begin{array}{r} 203 \\ 2\overline{)406} \end{array}$$

- How many times does 2 go into 4? Two times. Write 2 as the first digit of the quotient (above the 4).
- How many times does 2 go into 0? Zero times. Write 0 as the next digit of the quotient.
- How many times does 2 go into 6? Three times. Write 3 as the last digit of the quotient. The answer is 203.

Example 2:

$$\begin{array}{r} 14 \\ 3\overline{)42} \\ -3 \\ \hline 12 \end{array} \qquad \begin{array}{r} 14 \\ 3\overline{)4{}^{1}2} \end{array}$$

Divide, multiply, and subtract. Instead of bringing down the next digit, write the subtraction answer in front of the next digit in the dividend and continue the steps of division.



Practice

1. Complete the problems using short division. (The answers will not have remainders.)

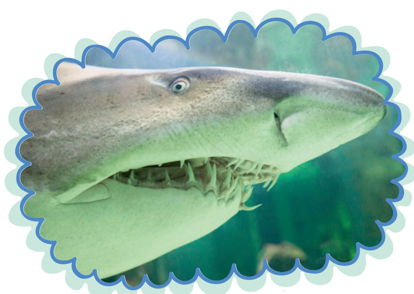
$3\overline{)63}$ $2\overline{)24}$ $4\overline{)84}$ $5\overline{)50}$

$3\overline{)123}$ $6\overline{)186}$ $8\overline{)816}$ $7\overline{)490}$

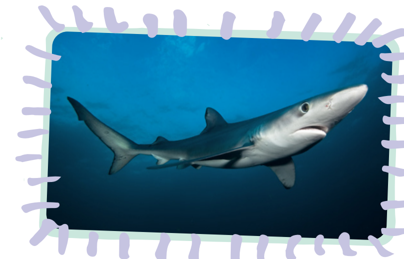
$9\overline{)1{,}179}$ $8\overline{)2{,}488}$ $5\overline{)4{,}100}$ $6\overline{)1{,}740}$

2. A bull shark often has a grand total of 350 teeth in its mouth at any given time! It has 7 teeth in each row. How many rows of teeth does a bull shark have?

Hint: Make sure to label your answer.



3. Blue sharks live in groups called schools, which are usually all male or all female. Female blue sharks can give birth to a lot of pups (shark babies)! If there are 6 females in a school, each one has the same number of pups, and they have a total of 810 pups, how many pups does each shark have? Show your work. Check your answer.



4. Here are pictures of nine real shark teeth. Complete the problems next to the teeth using short division. (The answers will have remainders.)

 $3\overline{)47}$  $4\overline{)55}$  $6\overline{)74}$

 $7\overline{)750}$  $5\overline{)514}$  $7\overline{)802}$

 $9\overline{)379}$  $5\overline{)1{,}602}$  $3\overline{)701}$

FINS & FACTS

Sharks are amazing fish! The quotients for the problems below show the life span (in years) of five various sharks. Use any strategy to find the quotients.

Your challenge is to find the life span of Greenland sharks. There will be two fins that don't show life spans between 20 and 100 years. Write those quotients on the blank lines in the chart.

If the quotient is . . .	write this at the top of the fin,	which stands for this shark.
20–30 years	H	Hammerhead
40–50 years	T	Tiger Shark
60–70 years	GW	Great White
80–100 years	W	Whale Shark
_____–_____ years	G	Greenland

All done! No review.

UNiT ASSESSMenT

LESSONS 29-30

Parent/Teacher

Read the following information aloud to the child: 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, make sure to 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, make sure to 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. There are no videos, mini lessons, or practice problems for Lessons 29–30.

For Lesson 29, have the child complete all the exercises with purple headers only. Correct the work. If the child makes any mistakes in a section, check the orange "Additional Practice" checkbox for that section.

For Lesson 30, have the child complete all the orange sections **that are checked**. If the child still makes multiple mistakes, make sure the child understands why. All the principles will be reviewed again in upcoming units. If the child has only a few or no orange sections to practice, the child may spend time doing math games or move on to the next lesson.

Student

Number Patterns/Divisibility Strategies (Lessons 1 & 3)

Complete the number pattern and write the rule.

110, 125, 140, ______, ______, ______, ______ rule: ______________

Circle the numbers that 9,640 is divisible by.

2 3 4 5 6 9 10

☐ Additional Practice

Look at the numbers to see how they change from one number to the next. Are they increasing or decreasing? By how much? Complete the number pattern and write the rule.

99, 88, 77, ______, ______, ______, ______ rule: ______________

Divisibility rules review: **2** (even number), **3** (sum of digits divisible by 3), **4** (last two digits are divisible by 4), **5** (ends with 0 or 5), **6** (divisible by 2 & 3), **9** (sum of digits divisible by 9), **10** (ends in 0)

Circle the numbers that 4,824 is divisible by.

2 3 4 5 6 9 10

Factors of Prime & Composite Numbers (Lesson 2)

List the factors of each number. Then circle the factors that are prime numbers.

17: ______________ 20: ______________

35: ______________ 41: ______________

☐ Additional Practice

Prime numbers have only two factors: the number itself and 1. Composite numbers have more than two factors. List the factors of each number. Then circle the factors that are prime numbers.

30: ______________ 55: ______________

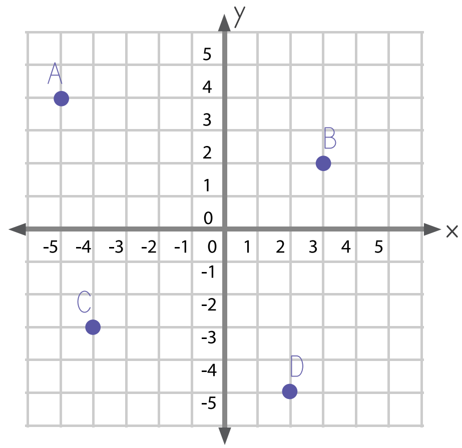
18: ______________ 43: ______________

GRAPHING ORDERED PAIRS (LESSON 23)

Write the coordinates for each point.

A: B:

C: D:



Plot and label the following points on the coordinate plane on the right.

E: (1, 4) F: (-3, 0)

G: (-2, 2) H: (1, -3)

I: (-2, -4)

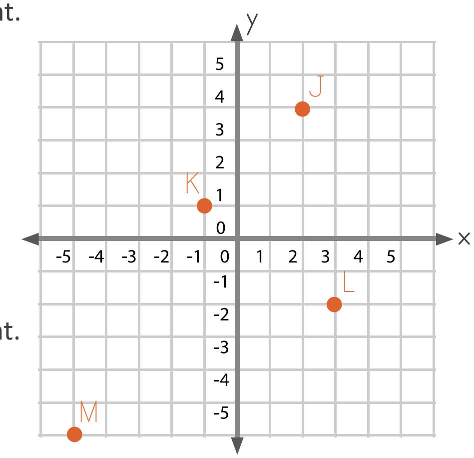
Additional Practice

Start at the origin (0, 0). The first coordinate of the ordered pair shows the position horizontally (left and right) along the x-axis. The second coordinate shows the vertical (up and down) position along the y-axis. Write the coordinates for each point.

Hint: Positives go up or right, and negatives go down or left.

J: K:

L: M:



Plot and label the following points on the coordinate plane on the right.

N: (1, 2) O: (0, -5)

P: (-3, 4) Q: (-4, 0)

R: (5, -3)

IDENTIFY, DRAW & NAME GEOMETRIC FIGURES (LESSONS 24 & 25)

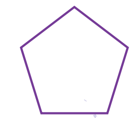
Draw lines.

1 vertical:

2 parallel:

Name the ray.

What is this shape?



Additional Practice

Polygons are usually named by the number of sides they have. Use any two points to name a line. Start with the endpoint to name a ray. To name a polygon, start at any vertex (corner) and name each vertex in order around the shape until all the vertices are named.

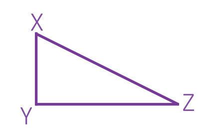
Draw the lines.

a horizontal line:

an oblique line:

perpendicular lines:

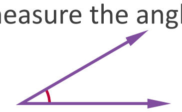
Name the following.



MEASURING & DRAWING ANGLES (LESSON 26)

Use a protractor to . . .

measure the angle.



draw an angle that is 75°.

Additional Practice

Place the vertex (corner) of the angle in the midpoint of the protractor. Line up a side on the baseline. Use the other side of the angle to find the degrees.

Measure the angle.

Draw an angle that measures 120°.

UNIT 2 OVERVIEW

LESSONS 31–60

Extra Supplies Needed

- scissors
- ruler
- protractor
- colored pencils
- coin
- 1 standard dice
- paper clip

New Concepts Taught

- conversions between degrees Fahrenheit and Celsius
- conversions of decimal numbers and percents to fractions
- decimal number comparisons through the ten-thousandths place
- decimal numbers on a number line
- decimal numbers rounded to the hundredths place
- decimal numbers to the ten-thousandths place
- least common multiples
- measurement with a ruler to an eighth of an inch
- multiplication of two fractions
- ordinal numbers to 100th
- place value through the billions
- subtraction of fractions and mixed numbers from whole numbers
- translational symmetry

Concepts Reviewed and Expanded Upon

- addition and subtraction with decimal numbers
- addition and subtraction with mixed numbers
- conversions between units of weight
- equivalent decimal numbers
- equivalent fractions
- fraction comparisons
- fractions and mixed numbers on a number line
- fractions in simplest form
- fractions with wholes
- lines of symmetry
- perimeter and area of irregular shapes
- probability
- quadrilateral classification
- quotients as mixed numbers
- reflectional and rotational symmetry
- scales
- transformations
- triangle classification by angles and sides

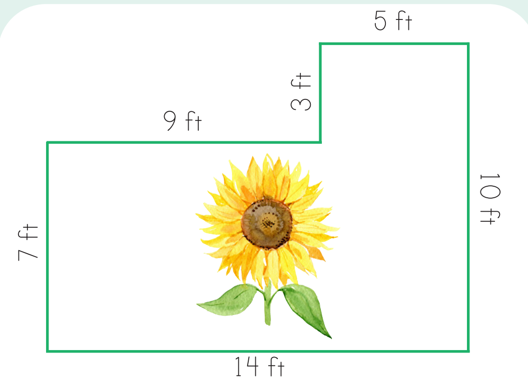
Lesson 37

PERIMETER AND AREA OF IRREGULAR SHAPES

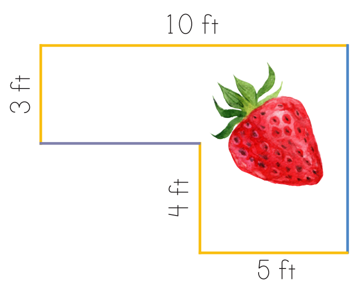
- Complete today's *Math 5 Mental Math Map Mysteries* activity.
- Watch the video lesson and/or read the mini lesson. There is no review in this lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful .com/Math5.



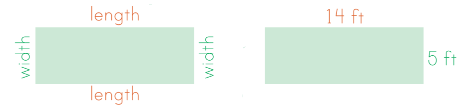
perimeter = __________ area = __________



Length of the blue side: ______ Length of the purple side: ______

Mini Lesson

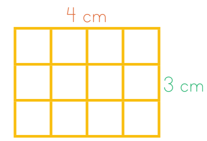
Perimeter is the total length of all sides of a two-dimensional shape. The longer side of a rectangle is the length. The shorter side of a rectangle is the width.



P = 14 ft + 5 ft + 14 ft + 5 ft = 38 ft

Area is the number of square units needed to cover the surface of an object.

This rectangle is covered with 12 square centimeters. This can be written as 12 cm^2.

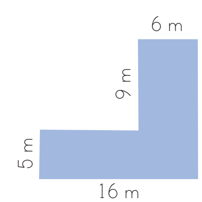


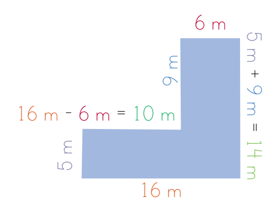
To find the **area of a rectangle**, multiply the length times the width. A = L × W
Remember that the answer will be in square units.

Irregular Shapes

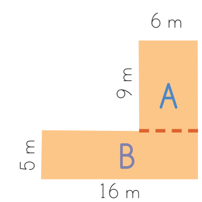
To find the **perimeter of an irregular shape**, add the lengths of all the sides. Use clues from other sides to find missing side lengths.

To find the **area of an irregular shape**, divide the shape into smaller rectangles. Then add the areas of the smaller rectangles.

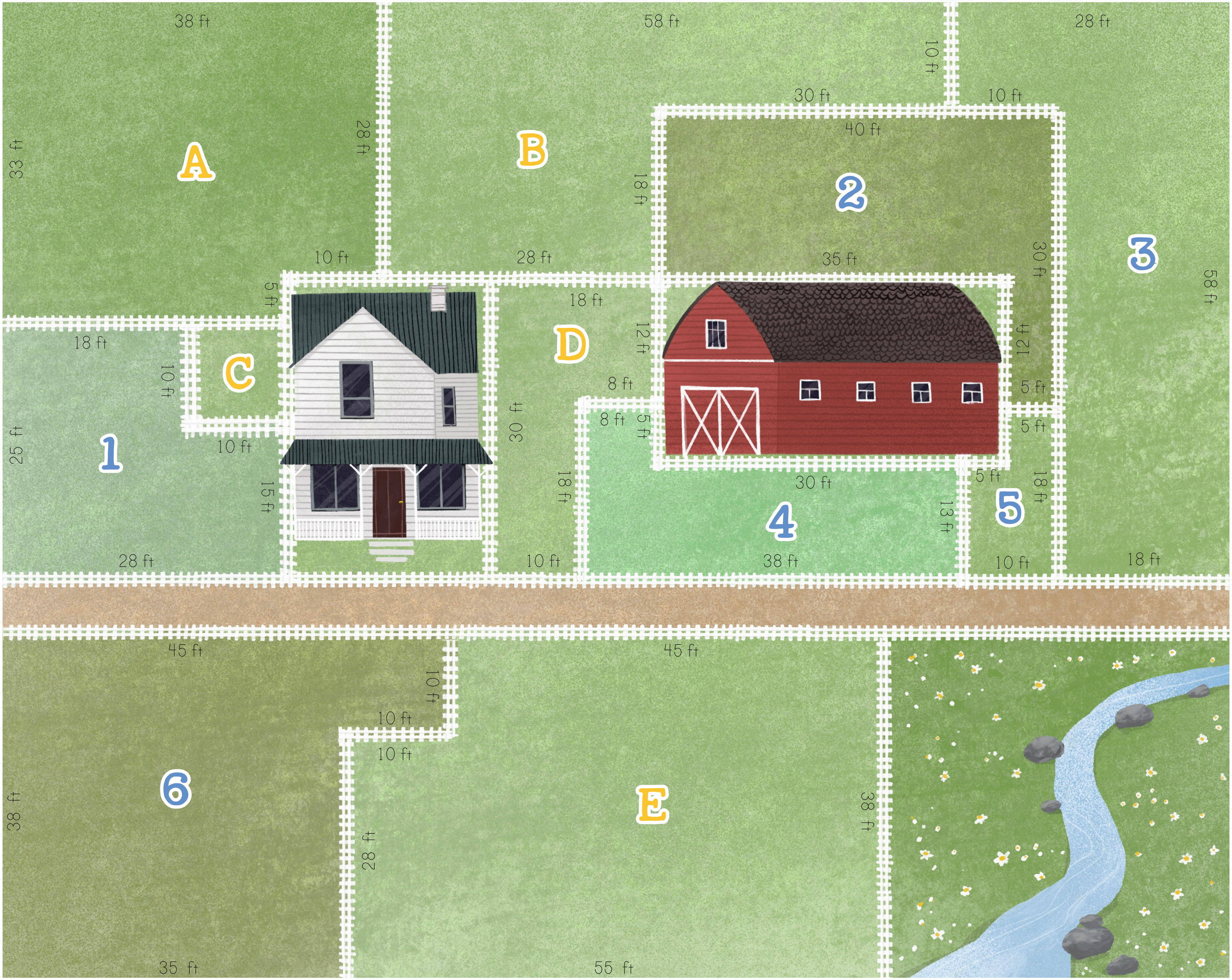




P = 5 m + 10 m + 9 m + 6 m + 14 m + 16 m = 60 m



Area A: 6 m × 9 m = 54 m^2
Area B: 16 m × 5 m = 80 m^2
Area of irregular shape:
54 m^2 + 80 m^2 = 134 m^2



A
B
C
D
E
1
2
3
4
5
6
38 ft
58 ft
28 ft
10 ft
30 ft
10 ft
40 ft
33 ft
28 ft
18 ft
58 ft
10 ft
28 ft
35 ft
30 ft
5 ft
18 ft
18 ft
10 ft
12 ft
12 ft
8 ft
8 ft
5 ft
5 ft
5 ft
10 ft
25 ft
30 ft
15 ft
18 ft
30 ft
5 ft
18 ft
13 ft
28 ft
10 ft
38 ft
10 ft
18 ft
45 ft
45 ft
10 ft
10 ft
10 ft
38 ft
28 ft
38 ft
35 ft
55 ft

Build-a-Farm Practice

The lengths on the farm are measured in feet. Find the **area** of each shape with a **letter**. Find the **perimeter** of each shape with a **number**. Then read the clues to discover where the crops and animals belong on the farm. Write the correct letter or number in the box next to each clue. Use the Lesson 37 stickers from the back of your Math 5 book to mark each place.

Find the Areas

To determine the area of an irregular shape, either divide the shape into two rectangles and add the two areas OR add a corner to create a larger rectangle and then subtract the area of the smaller corner from the area of the larger rectangle.

+ or -

A: ____ ○ ____ = ________

B: ____ ○ ____ = ________

C: ________

D: ____ ○ ____ = ________

E: ____ ○ ____ = ________

Find the Perimeters

1: ____ + ____ + ____ + ____ + ____ + ____ = ____

2: ____ + ____ + ____ + ____ + ____ + ____ = ____

3: ____ + ____ + ____ + ____ + ____ + ____ = ____

4: ____ + ____ + ____ + ____ + ____ + ____ = ____

5: ____ + ____ + ____ + ____ + ____ + ____ = ____

6: ____ + ____ + ____ + ____ + ____ + ____ = ____

Clues

- ☐ The pigs belong in the shape with a perimeter of 56 ft. ☐
- ☐ Alfalfa grows in the shape with an area of 1,204 ft². ☐
- ☐ There is an orchard with an area of 1,084 ft². ☐
- ☐ The llamas have a fence with a perimeter of 166 ft. ☐
- ☐ Horses roam in a perimeter of 140 ft. ☐
- ☐ The fence for the goats has a perimeter of 112 ft. ☐
- ☐ The family garden has an area of 396 ft². ☐
- ☐ You can find chickens in an area of 100 ft². ☐
- ☐ Oats grow in an area of 1,990 ft². ☐
- ☐ Cows are in a pasture with a perimeter of 172 ft. ☐
- ☐ Sheep are within a perimeter of 106 ft. ☐

All done! No review.

Lesson 46

PLACE VALUE WITH DECIMALS

- Complete today's *Math 5 Mental Math Map Mysteries* activity.
- Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math5.

44.521 sec

69.528 sec

Mini Lesson

The value of a digit depends on its place in a number. Place values to the right of the ones column are less than one whole. They are fractional parts called decimals. A ***decimal number*** is a number that has a decimal point. A ***decimal point*** is a dot that separates a whole number from a fractional part. If there are no fractional parts, a decimal point is not needed.

Examples:

12
whole number with no fractional part
(A decimal point is not needed.)

12.3
whole number | decimal point | fractional part

Here is the place value chart with decimals. Multiply by 10 to move one place value to the left.

×10 ×10 ×10 ×10 ×10 ×10 ×10 ×10 ×10 ×10 ×10 ×10 ×10 ×10

Billions			Millions			Thousands			Ones			Decimals		
Hundred Billions	Ten Billions	Billions	Hundred Millions	Ten Millions	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths

÷10 ÷10 ÷10 ÷10 ÷10 ÷10 ÷10 ÷10 ÷10 ÷10 ÷10 ÷10 ÷10 ÷10

Divide by 10 to move one place value to the right. To find the first three place values to the right of the ones, continue to divide by ten.

$1 \div 10 = \frac{1}{10}$ This is called a tenth.

$\frac{1}{10} \div 10 = \frac{1}{100}$ This is called a hundredth.

$\frac{1}{100} \div 10 = \frac{1}{1{,}000}$ This is called a thousandth.

The first three decimal place values are tenths, hundredths, and thousandths. Notice the pattern:

thousands	hundreds	tens	ones	tenths	hundredths	thousandths
1,000	100	10	1	$\frac{1}{10}$ or 0.1	$\frac{1}{100}$ or 0.01	$\frac{1}{1{,}000}$ or 0.001

Whole number place values have "s" at the end; decimal place values have "ths" at the end.

Practice

1. Name the place value of the 5 in each number.

546,902,378 ______________________

77**5**,830,072,004 ______________________

860,489,694,201.**5** ______________________

2,604,843.7**5**1 ______________________

493.80**5** ______________________

532,140,794,990.134 ______________________

2. Write each digit in the correct place.

___ ___ ___ , ___ ___ ___ , ___ ___ ___ , ___ ___ ___ . ___ ___ ___

- [ ] 8 in the tens place
- [ ] 1 in the ten thousands place
- [ ] 2 in the hundred millions place
- [ ] 0 in the ten billions place
- [ ] 5 in the hundreds place
- [ ] 9 in the thousandths place and ten millions place
- [ ] 4 in the tenths place and the thousands place
- [ ] 6 in the millions place and hundred billions place
- [ ] 3 in the hundredths place and hundred thousands place
- [ ] 7 in the billions place and the ones place

3. Write the digit in each place value in this number: 3,278,049.516

tenths place ______ hundred thousands place ______

ten thousands place ______ tens place ______

thousandths place ______ hundreds place ______

millions place ______ thousands place ______

hundredths place ______ ones place ______

4. Write the numerical value of each **green** digit. The first one is given as an example.

594,839,012.853 value: $\frac{5}{100}$ or 0.05

852,926.347 value: ______________________

12,048,302.83 value: ______________________

672,950,311,842.798 value: ______________________

460,714,299,861.15 value: ______________________

926,637,598.037 value: ______________________

834,823,093,582.592 value: ______________________

5. Write each world record time or distance in expanded form. Write the decimal parts as fractions on the first line and as decimal numbers on the second line. The first one is given as an example.

Joseph Schooling—swimming the 100 m butterfly in 2016

50.39 seconds $50 + \frac{3}{10} + \frac{9}{100}$

$50 + 0.3 + 0.09$

Emily Seebohm—swimming the 100 m backstroke in 2012

58.23 seconds ______________________

____

Kim Boutin—speed skating 500 m in 2019

41.936 seconds ______________________

____

Pavel Kulizhnikov—speed skating 500 m in 2019

33.61 seconds ______________________

____

Javier Sotomayor—high jump in 1993

8.038 feet ______________________

____

Review

1. Find each sum or difference. Write the answer in simplest form.

$5\frac{1}{3} + 2\frac{2}{3} =$ ☐ $12\frac{1}{4} + 3\frac{1}{4} =$ ☐ $31\frac{4}{9} + 22\frac{5}{9} =$ ☐

$14 - \frac{5}{6} =$ ☐ $9 - 4\frac{3}{4} =$ ☐ $17 - 11\frac{1}{5} =$ ☐

2. Simplify. Use scratch paper if you need extra space.

$12^2 =$ ☐ $3^3 =$ ☐ $2^5 =$ ☐ $14^2 =$ ☐ $4^3 =$ ☐ $5^3 =$ ☐

3. Find the least common multiple of 3, 5, and 6.

3: ______________________

5: ______________________

6: ______________________

LCM:

4. Use the rule to continue each sequence.

3, ______, ______, ______, ______ rule: Multiply by 3.

8, ______, ______, ______, ______ rule: Multiply by 10.

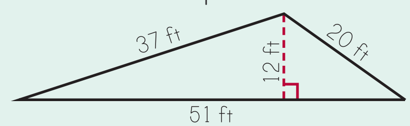
5. Convert.

15 °C = _____ °F

Hint: The formula is F = 9C ÷ 5 + 32.

6. a. Write the area formula for a triangle: ______________________

b. Find the area and perimeter of the triangle.



area = __________

perimeter = __________

UNIT 3 OVERVIEW

LESSONS 61–90

Extra Supplies Needed

- protractor
- 1 standard dice
- scissors
- tape
- index card or cardstock
- colored pencils

New Concepts Taught

- circumference and area of circles
- conversions between decimal numbers and percents
- creation of irregular tessellations
- decimal number multiplication and division by powers of 10
- division by unit fractions
- division with reciprocals
- elapsed time past 12 hours, crossing AM and PM
- formula to convert mixed numbers to improper fractions
- fraction multiplication with cancellations
- fractions to percents conversions
- greatest common factors
- least common multiple to find common denominators
- multiplication of fractions and whole numbers
- multiplication of two decimal numbers
- pi
- proper fractions, improper fractions, and mixed numbers rounded to the nearest whole
- ratios
- reciprocals
- reflections, rotations, and translations with graphing
- surface area of geometric solids

Concepts Reviewed and Expanded Upon

- conversions between improper fractions and whole or mixed numbers
- conversions between units of capacity
- distributive property
- multiplication of decimal numbers and whole numbers
- parts of a circle: center, radius, diameter
- regular and semi-regular tessellations
- time

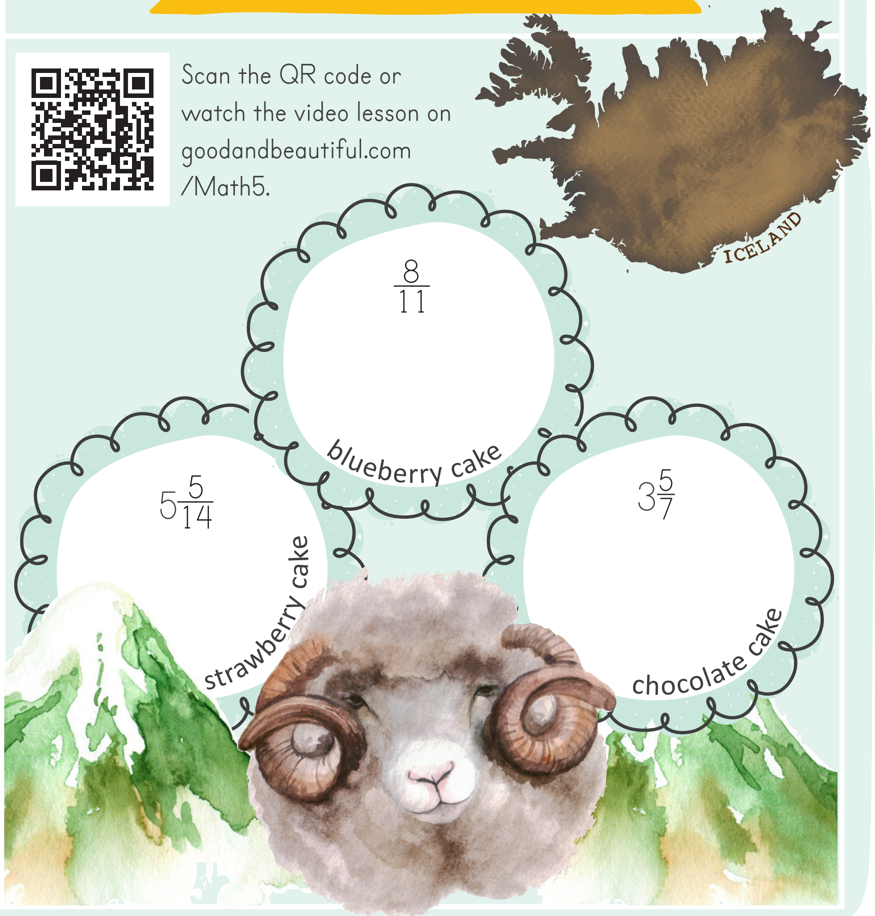
Lesson 67

ROUNDING FRACTIONS AND MIXED NUMBERS TO THE NEAREST WHOLE NUMBER

- ☐ Complete today's *Math 5 Mental Math Map Mysteries* activity.
- ☐ Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com /Math5.



Mini Lesson

Rounding is replacing a number with a number close in value that is simpler to work with.

A fraction is

- equal to $\frac{1}{2}$ if the numerator is half of the denominator.
  Example: $\frac{4}{8} = \frac{1}{2}$ The numerator (4) is half of the denominator (8).
- less than $\frac{1}{2}$ if the numerator is less than half of the denominator.
  Example: $\frac{3}{8} < \frac{1}{2}$ The numerator (3) is less than half of the denominator (8).
- greater than $\frac{1}{2}$ if the numerator is greater than half of the denominator.
  Example: $\frac{5}{8} > \frac{1}{2}$ The numerator (5) is greater than half of the denominator (8).

Rounding a proper fraction to the nearest whole number:

■ If a fraction is less than $\frac{1}{2}$, round down to 0. ■ If a fraction is equal to or greater than $\frac{1}{2}$, round up to 1.

Examples:

$\frac{3}{10} \rightarrow 0$	$\frac{5}{10} \rightarrow 1$	$\frac{7}{10} \rightarrow 1$
less than $\frac{1}{2}$ ⟶ round down	$\frac{1}{2}$ ⟶ round up	greater than $\frac{1}{2}$ ⟶ round up

Rounding a mixed number to the nearest whole number:

■ Look at the fraction part. ■ If the fraction is less than $\frac{1}{2}$, round down to the nearest whole number. ■ If the fraction is equal to or greater than $\frac{1}{2}$, round up to the nearest whole number.

Examples: These mixed numbers are between 2 and 3, so they will either round down to 2 or round up to 3.

$2\frac{5}{12} \rightarrow 2$	$2\frac{6}{12} \rightarrow 3$	$2\frac{11}{12} \rightarrow 3$
less than $\frac{1}{2}$ ⟶ round down	$\frac{1}{2}$ ⟶ round up	greater than $\frac{1}{2}$ ⟶ round up

Rounding an improper fraction to the nearest whole number:

■ Convert the improper fraction to a mixed number. Then look at the fraction part. ■ If the fraction is less than $\frac{1}{2}$, round down to the nearest whole number. ■ If the fraction is equal to or greater than $\frac{1}{2}$, round up to the nearest whole number.

Examples: These improper fractions convert to mixed numbers that are between 4 and 5, so they will either round down to 4 or round up to 5.

$\frac{25}{6} = 4\frac{1}{6} \rightarrow 4$	$\frac{27}{6} = 4\frac{3}{6} \rightarrow 5$	$\frac{29}{6} = 4\frac{5}{6} \rightarrow 5$
less than $\frac{1}{2}$ ⟶ round down	$\frac{1}{2}$ ⟶ round up	greater than $\frac{1}{2}$ ⟶ round up

Practice

1. The wool of Icelandic sheep is used to make beautiful yarn, some natural and some dyed. Sometimes knitters use fractions and rounding to tell if there is enough yarn for a project. Circle the fractions that are equivalent to $\frac{1}{2}$, underline the fractions that are less than $\frac{1}{2}$, and cross out the fractions that are greater than $\frac{1}{2}$.

$\frac{5}{9}$	$\frac{3}{4}$	$\frac{2}{5}$	$\frac{8}{11}$	$\frac{9}{18}$	$\frac{6}{19}$
$\frac{3}{8}$	$\frac{4}{7}$	$\frac{5}{8}$	$\frac{7}{14}$	$\frac{7}{12}$	$\frac{5}{11}$
$\frac{5}{10}$	$\frac{6}{12}$	$\frac{7}{13}$	$\frac{4}{11}$	$\frac{9}{20}$	$\frac{3}{7}$
$\frac{8}{15}$	$\frac{11}{22}$	$\frac{4}{5}$	$\frac{9}{19}$	$\frac{5}{7}$	$\frac{12}{24}$
$\frac{7}{10}$	$\frac{47}{80}$	$\frac{13}{26}$	$\frac{31}{60}$	$\frac{25}{50}$	$\frac{19}{40}$
$\frac{50}{100}$	$\frac{17}{30}$	$\frac{22}{44}$	$\frac{37}{70}$	$\frac{43}{90}$	$\frac{25}{48}$

2. Round each proper fraction to the nearest whole number.

$\frac{2}{7}$	$\frac{5}{6}$	$\frac{4}{5}$	$\frac{1}{2}$
$\frac{8}{16}$	$\frac{3}{5}$	$\frac{4}{9}$	$\frac{7}{11}$
$\frac{5}{8}$	$\frac{6}{11}$	$\frac{9}{22}$	$\frac{7}{15}$
$\frac{10}{20}$	$\frac{12}{25}$	$\frac{8}{13}$	$\frac{9}{10}$

3. Warm, soft sweaters are made from the wool of Iceland's sheep. Help the sweater maker estimate how many boxes are full of sweaters by rounding each mixed number to the nearest whole number.

$3\frac{1}{6}$	$1\frac{4}{5}$	$9\frac{2}{3}$	
$5\frac{3}{5}$	$4\frac{2}{5}$	$7\frac{3}{8}$	$8\frac{4}{7}$
$10\frac{8}{11}$	$2\frac{3}{7}$	$12\frac{3}{4}$	$11\frac{9}{20}$
$8\frac{5}{8}$	$6\frac{6}{11}$	$3\frac{11}{20}$	$4\frac{12}{24}$
$9\frac{6}{13}$	$10\frac{4}{9}$	$7\frac{1}{2}$	$5\frac{15}{26}$

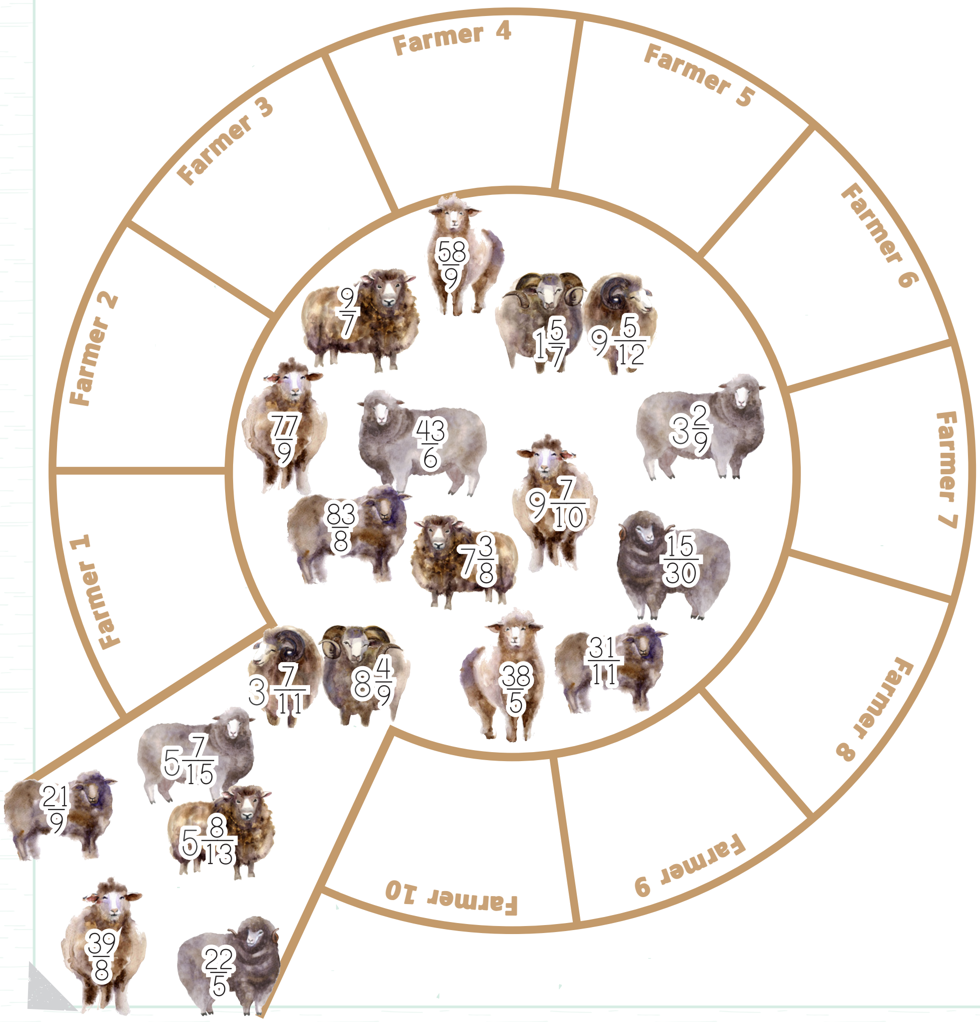
4. Round each improper fraction to the nearest whole number.

Hint: Convert the improper fractions to mixed numbers before rounding.

$\frac{7}{2}$	$\frac{12}{5}$	$\frac{8}{3}$
$\frac{29}{7}$	$\frac{65}{6}$	$\frac{21}{4}$
$\frac{13}{3}$	$\frac{95}{9}$	$\frac{37}{5}$
$\frac{46}{7}$	$\frac{53}{8}$	$\frac{59}{6}$
$\frac{73}{7}$	$\frac{87}{10}$	$\frac{52}{9}$

Rounding Roundup

5. When Icelandic sheep come down from the mountains after a summer of grazing, they are placed in a round pen and sorted out so each farmer can take home the correct animals. First, round each sheep's fraction or mixed number to the nearest whole number. Then round up each sheep into the correct pen by writing its fraction or mixed number in the pen of the farmer whose whole number matches the rounded number.



Review

1. Convert each fraction to a percent.

$\frac{9}{10}$ $\frac{4}{5}$ $\frac{13}{20}$ $\frac{7}{50}$

2. Convert each percent to a fraction. Write each fraction in simplest form.

95% 28% 56% 45%

3. Add or subtract using common denominators.

$\frac{2}{3} + \frac{1}{8} =$

$\frac{1}{10} + \frac{2}{5} + \frac{2}{15} =$

$\frac{9}{10} - \frac{5}{8} =$

$\frac{6}{7} - \frac{2}{3} =$

4. Convert each decimal number to a mixed number. Write each mixed number in simplest form.

3.4 10.85 9.05 4.64

5. Write each mixed number as an improper fraction.

$2\frac{7}{9}$ $3\frac{3}{8}$ $1\frac{9}{10}$ $4\frac{5}{9}$

6. Find the greatest common factor (GCF) of the set of numbers.

factors of 10: ______________________

factors of 15: ______________________

factors of 30: ______________________

GCF of 10, 15, 30:

Lesson 71

RATIOS

- [ ] Complete today's *Math 5 Mental Math Map Mysteries* activity.
- [ ] Watch the video lesson and/or read the mini lesson.

Video Lesson

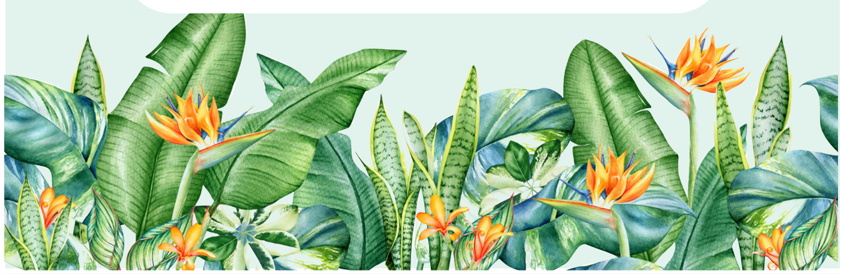
Scan the QR code or watch the video lesson on goodandbeautiful.com /Math5.

ratio of men to women:

____

ratio of men to people:

____



Mini Lesson

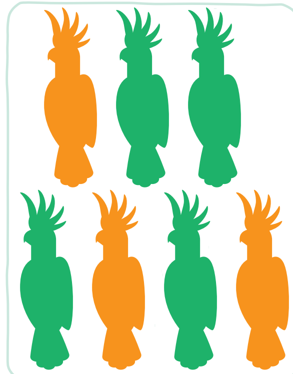
A ***ratio*** is a relationship between two quantities.

A ratio can be expressed in several forms:

- with a colon 3 : 5
- as a fraction $\frac{3}{5}$
- with the word "to" 3 to 5

All three forms are read "three to five."

Write the terms of a ratio in the order they are given. When a ratio is written as a fraction, the first number becomes the numerator, and the second number becomes the denominator.



Examples:

ratio of orange parrots to green parrots:
3 : 4 $\frac{3}{4}$ 3 to 4

ratio of green parrots to orange parrots:
4 : 3 $\frac{4}{3}$ 4 to 3

ratio of orange parrots to all the parrots:
3 : 7 $\frac{3}{7}$ 3 to 7

ratio of all the parrots to green parrots:
7 : 4 $\frac{7}{4}$ 7 to 4

Notice that a ratio can compare part of a group with another part of a group or part of a group with a whole group.

Write ratios in simplest form. To reduce a ratio, divide both terms by the same common factor.

Examples:

Ratio		Ratio in Simplest Form
10 : 15	divide both	2 : 3
$\frac{10}{15}$	terms	$\frac{2}{3}$
10 to 15	by 5	2 to 3

Do not write a ratio as a mixed number. For example, in fraction form the ratio nine to seven is written $\frac{9}{7}$, not $1\frac{2}{7}$.

Practice

1. Practice writing ratios three different ways by filling in the chart. The first is given as an example.

	Ratio with a Colon	Ratio as a Fraction	Ratio with the Word "to"
two to nine	2 : 9	$\frac{2}{9}$	2 to 9
four to eleven			
ten to seven			
three to thirteen			
fifteen to eight			

2. Write each ratio in simplest form with a colon.

5 : 10	24 : 30	16 : 40
21 : 56	10 : 18	36 : 81
45 : 18	33 : 88	144 : 12
35 : 49	63 : 27	30 : 54
80 : 120	75 : 100	64 : 16

3. Write each ratio first with a colon and then as a fraction. Remember to write ratios in simplest form.

ratio of birds to lizards

ratio of sloths to snakes

ratio of snakes to birds

ratio of sloths to butterflies

ratio of lizards to butterflies

ratio of jaguars to lizards

ratio of birds to sloths

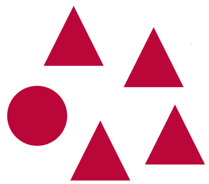
ratio of blue butterflies to total butterflies

ratio of mammals to reptiles

ratio of birds to animals that fly

4. Draw a picture to show each ratio. The first is given as an example.

a. The ratio of circles to triangles is 1 : 4.



b. The ratio of rectangles to ovals is $\frac{5}{3}$.

c. The ratio of hearts to stars is 6 : 7.

d. The ratio of trapezoids to squares is $\frac{2}{5}$.

e. The ratio of Xs to Os is 5 : 4.

f. The ratio of As to Bs is $\frac{3}{7}$.

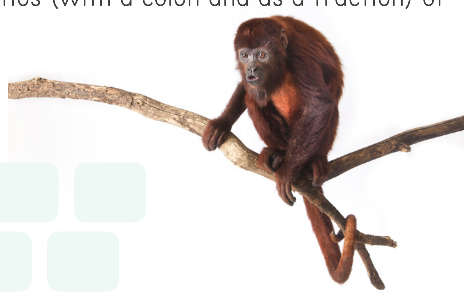
5. A howler monkey's howl can be heard more than 3 mi (4.8 km) away. One group of howler monkeys has 14 members. Of those members, 9 are females and 5 are males. Write ratios (with a colon and as a fraction) of

males to females.

females to males.

females to the total members.

the total members to males.



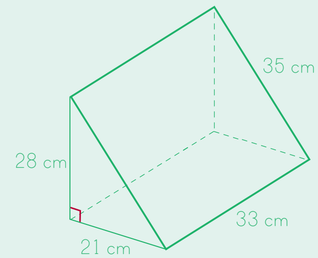
6. Compare the ratios and write = or ≠ between them.

$\frac{3}{9}$ ◯ 1 : 3   4 to 8 ◯ 8 : 4   36 : 24 ◯ 3 : 2   9 : 27 ◯ 1 to 3

42 : 18 ◯ $\frac{3}{7}$ 15 : 45 ◯ 3 to 5 $\frac{77}{22}$ ◯ 7 to 2   16 : 18 ◯ $\frac{9}{8}$

Review

1. What is the surface area of the triangular prism?



2. Cancel first, and then multiply.

$\frac{7}{20} \times \frac{15}{14} =$ $\frac{4}{7} \times \frac{3}{8} \times \frac{7}{9} =$ $\frac{8}{11} \times \frac{22}{5} \times \frac{25}{4} =$

3. Use the order of operations to find each answer.

$6^2 + (15 - 7) \div 2 =$ $16 \div 4 + 5 \times 3 - 2^3 =$

$(7 + 5) \times 3 \div 3^2 - 4 =$ $(9 \times 12 + 20) \div 2^2 =$

4. Write the numbers in order from least to greatest.

-3, 0, -8, 4, -9, 2 ________________

5, -16, -2, $\frac{1}{2}$, $-3\frac{1}{2}$, 1 ________________

5. Multiply. Write answers in simplest form as a whole or mixed number.

$6 \times \frac{1}{3} =$ $\frac{2}{5} \times 4 =$ $7 \times \frac{4}{5} =$ $\frac{3}{4} \times 8 =$

6. Round the fractions and mixed numbers to the nearest whole number.

$\frac{3}{8}$ $4\frac{4}{7}$ $10\frac{1}{2}$ $14\frac{5}{8}$ $\frac{6}{11}$ $\frac{37}{12}$

Lesson 74

USING THE DISTRIBUTIVE PROPERTY

- Complete today's *Math 5 Mental Math Map Mysteries* activity.
- Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math5.

$5 \times 18 =$

$5 \times (20 - 2) =$

$(\_\_\_ \times \_\_\_) - (\_\_\_ \times \_\_\_) =$

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

$\_\_\_$

Mini Lesson

The ***distributive property*** says multiplying by a sum (or difference) is the same as multiplying by each value in the sum (or difference) and combining the products.

One way to simplify a multiplication problem is to write one of the factors as an addition or subtraction problem. Then apply the distributive property by multiplying the other factor by each value in the addition or subtraction problem. Finally, add or subtract the products.

Using the Distributive Property to Determine 3 × 12:

$3 \times 12 =$	Rewrite 12 as (10 + 2).
$3 \times (10 + 2) =$	Multiply 3 by 10. Multiply 3 by 2.
$(3 \times 10) + (3 \times 2) =$	Add the products. (If 12 had been written as a subtraction problem, the final step would have been to subtract the products.)
$30 + 6 = 36$	

Using the Distributive Property to Determine 12 × 19:

The factor 12 or the factor 19 can be written as several different addition or subtraction problems. Look for ways to write a factor that will make multiplication easier to perform. Here are three possibilities:

12×19	12×19	12×19
$12 \times (10 + 9)$	$12 \times (20 - 1)$	$(10 + 2) \times 19$

Now multiply (distribute) the factor outside the parentheses with each value inside the parentheses. Notice the addition or subtraction signs between the multiplication problems. They match the operation used to rewrite the factor.

12×19	12×19	12×19
$12 \times (10 + 9)$	$12 \times (20 - 1)$	$(10 + 2) \times 19$
$(12 \times 10) + (12 \times 9)$	$(12 \times 20) - (12 \times 1)$	$(19 \times 10) + (19 \times 2)$

Multiply the numbers in the parentheses. Then add or subtract the products.

$(12 \times 10) + (12 \times 9)$	$(12 \times 20) - (12 \times 1)$	$(19 \times 10) + (19 \times 2)$
$120 + 108$	$240 - 12$	$190 + 38$
228	228	228

Practice

1. Fill in the missing information and write the answer on the line.

$4 \times (6 + 9) = (4 \times \quad) + (4 \times \quad) = 24 + 36 =$ ______

$6 \times (5 + 8) = (6 \times \quad) + (6 \times \quad) = \quad + 48 =$ ______

$5 \times (7 - 3) = (\quad \times 7) - (\quad \times 3) = 35 - \quad =$ ______

$9 \times (8 + 7) = (9 \times \quad) + (\quad \times 7) = \quad + \quad =$ ______

$8 \times (2 + 9) = (\quad \times \quad) + (\quad \times \quad) = \quad + \quad =$ ______

$7 \times (9 - 2) = (\quad \times \quad) - (\quad \times \quad) = \quad - \quad =$ ______

$10 \times (2 + 9) = (\quad \times \quad) + (\quad \times \quad) = \quad + \quad =$ ______

2. Apply the distributive property. Then write the answer. The first one is given as an example.

$5(20 + 7) = (5 \times 20) + (5 \times 7) = 100 + 35 = 135$

$9(4 + 10) =$

$8(30 - 1) =$

$7(10 + 3) =$

$4(11 + 5) =$

$6(2 + 40) =$

$10(30 - 1) =$

$12(5 + 4) =$

3. Match the equivalent expressions.

3×84	$3 \times (80 + 4)$
14×29	$12 \times (90 + 2)$
9×13	$14 \times (30 - 1)$
28×5	$32 \times (20 - 2)$
7×26	$9 \times (10 + 3)$
32×18	$7 \times (20 + 6)$
12×92	$(20 + 8) \times 5$

4. Circle one factor. Write two different addition or subtraction problems for that factor and write them in parentheses. Try to think of numbers that would be easy to multiply by the other factor. The first one is given as an example.

7×39	15×28	31×19	8×22
$(40 - 1)$			
$(30 + 9)$			
23×12	9×38	45×8	14×11

5. Follow the guidelines below to use the distributive property to multiply two factors. Show your work. The first one is given as an example.

   a. Circle the factor you will break apart.

   b. Rewrite the circled factor as an addition or subtraction problem.

   c. Multiply the other factor by the numbers in the addition or subtraction problem.

   d. Add or subtract the products.

$3 \times 17 = 3 \times (20 - 3) = (3 \times 20) - (3 \times 3) = 60 - 9 = 51$

$4 \times 18 =$

$12 \times 31 =$

$49 \times 8 =$

$9 \times 15 =$

$16 \times 7 =$

$22 \times 41 =$

$12 \times 63 =$

6. Use the distributive property to help you solve the story problems.

   a. Caleb loves to collect leaves, and so does his big brother Dominic. Yesterday, Caleb collected 41 leaves, and Dominic collected 9 times that number of leaves. How many leaves did Dominic collect yesterday?

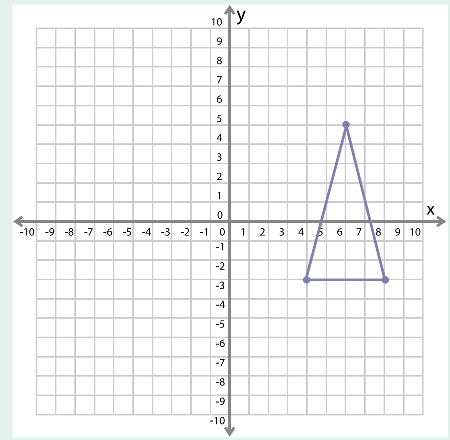
   b. Kai placed 4 candy bar bits on each cookie she baked. If she baked 98 cookies, how many candy bar bits did she use in all?

Review

1. Subtract.

$8 - 6.3 =$ $5 - 3.47 =$ $3.1 - 2.092 =$

2. Translate the isosceles triangle 6 units to the left and 1 unit up. Write the coordinates of the translated triangle's vertices.



____

____

____

3. Convert the mixed numbers to improper fractions.

$5\frac{3}{4} =$ ______ $9\frac{4}{5} =$ ______ $7\frac{2}{5} =$ ______ $6\frac{7}{10} =$ ______

4. Add or subtract the fractions.

$\frac{3}{5} + \frac{2}{3} =$ $\frac{4}{5} - \frac{3}{4} =$ $\frac{1}{2} + \frac{1}{3} + \frac{1}{4} =$ $\frac{8}{9} - \frac{3}{7} =$

5. Write the probability of rolling one standard dice and having it land on

- a number greater than 1. _____
- a number less than 3. _____
- an even number. _____
- a number greater than 6. _____

Lesson 87

TESSELLATIONS

Supplies
scissors, tape, cardstock or index card, colored pencils (optional)

- Complete today's *Math 5 Mental Math Map Mysteries* activity.
- Watch the video and/or read the mini lesson. There is no review.

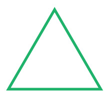
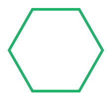
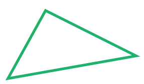
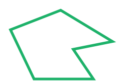
Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math5.

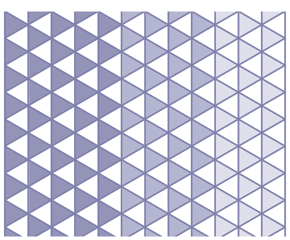
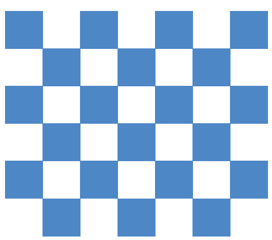
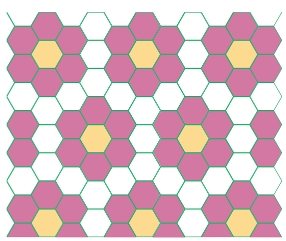
Mini Lesson

A ***tessellation*** is made by repeating shapes that fit together without overlapping or gaps. Tessellations are formed by rotating, reflecting, or translating shapes.

A ***regular polygon*** is a polygon that has all sides of equal length and all angles of equal measure. An irregular polygon is a polygon that is not regular.

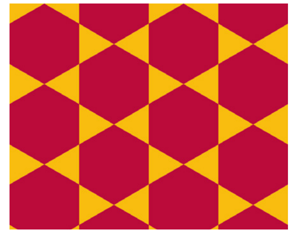
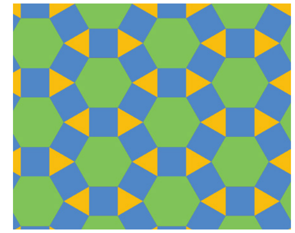
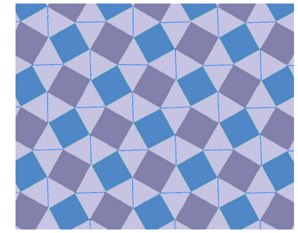
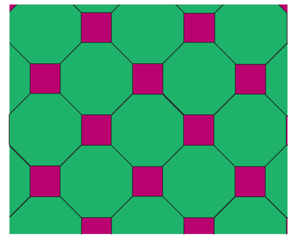
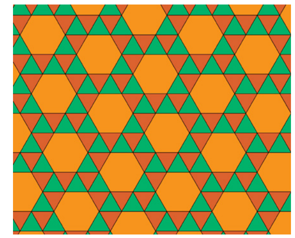
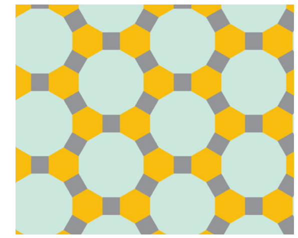
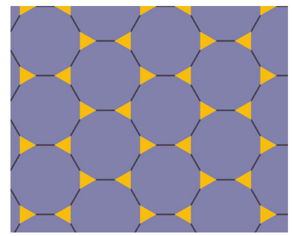
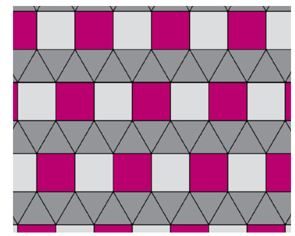
Examples:	Triangles	Hexagons
Regular Polygons		
Irregular Polygons		

In regular tessellations just one regular polygon is repeated. Only equilateral triangles, squares, and regular hexagons can be used to form regular tessellations. **Examples of regular tessellations:**

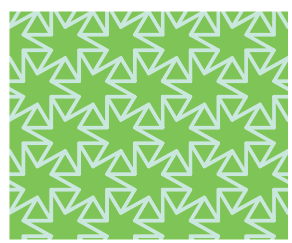
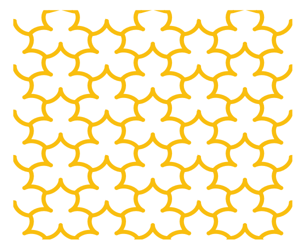
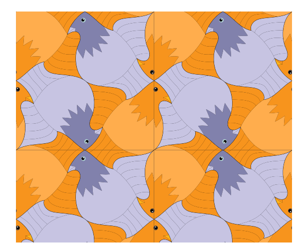
Semi-regular tessellations are created with two or more regular polygons, and the same shapes meet at each vertex. There are eight semi-regular tessellations.

Examples of semi-regular tessellations:

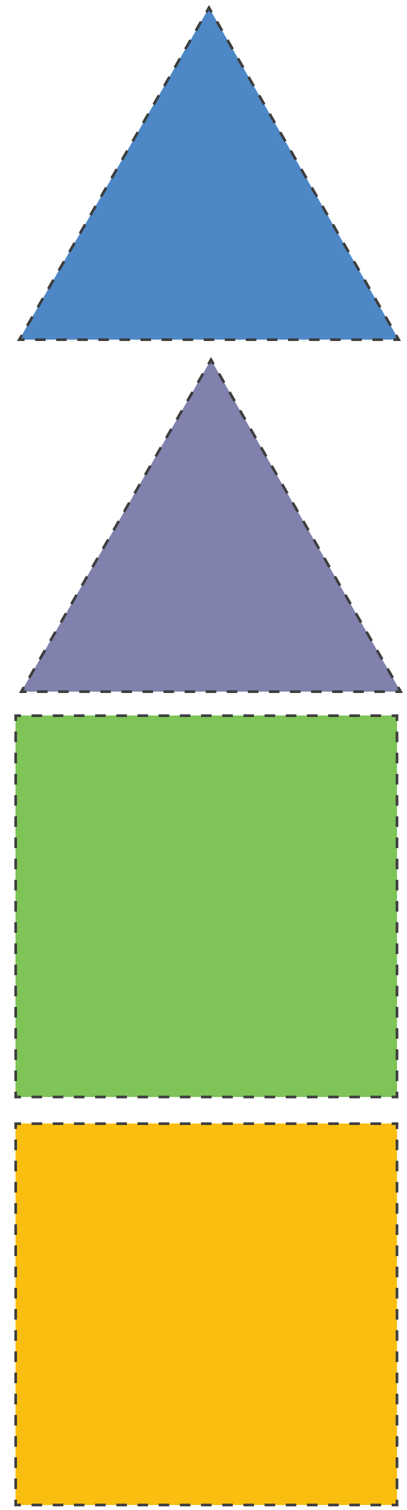
Irregular tessellations include all other tessellations. There are an infinite number of irregular tessellations that can be created with irregular polygons and shapes with curves.

Examples of irregular tessellations:

Practice

1. Cut out a shape of your choice on the right. You can modify the shape by cutting from one or more sides and taping the cut-off piece(s) to other sides. Trace it on cardstock or an index card, and then cut that shape out to use as a stencil. Use your stencil to create a tessellation in the space below. To learn how to create fun and unique irregular tessellations, watch the video lesson. If desired, decorate and color your completed tessellation.



This space is intentionally left blank for double-sided printing.

2. Cut out another shape of your choice from the previous page. Follow the same steps as before to create a different tessellation that fills the space below. Be creative and have fun!

All done! No review.

UNIT 4 OVERVIEW

LESSONS 91–120

Extra Supplies Needed

- 1 standard dice
- colored pencils
- ruler or straightedge
- protractor

New Concepts Taught

- averages with remainders
- base-5 number system
- circle graphs
- conversions between fractions, decimals, and percents
- conversions from fractions to decimals
- division by decimal numbers
- division with terminating and repeating decimals
- expressions and equations
- histograms
- line plots
- multiplication of mixed numbers
- number categories (natural numbers, whole numbers, and integers)
- percent of a number
- proportions
- Roman numerals to 1,000,0000
- scale drawings
- solutions to equations
- stem and leaf plots
- time zones
- Venn diagrams with sets
- volume of cylinders

Concepts Reviewed and Expanded Upon

- division of decimal numbers by whole numbers
- pictographs
- problem solving with multiple steps
- volume of cubes
- volume of rectangular prisms

Lesson 95

VENN DIAGRAMS WITH SETS

- Complete today's *Math 5 Mental Math Map Mysteries* activity.
- Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math5.

Mini Lesson

A ***set*** is a group or collection of objects. Objects in a set are called ***elements***. A list of elements can be written in curly braces (sometimes called curly brackets), and each element is separated by a comma. Three dots, called an ellipsis, can be written to show that numbers continue on.

Example: {2, 4, 6, 8, ...} ← curly brace (or bracket)

elements   ellipsis

Elements are not repeated, and order does not matter.

The example above is an infinite set because it continues on forever. A finite set has a limited number of elements.

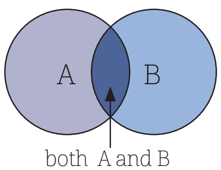
A subset is a set that is entirely part of another set. For example, natural numbers are a subset of whole numbers. Natural numbers and whole numbers are both subsets of integers.

If there is nothing in a set, it is called an empty set. An empty set is shown with this symbol: ∅.

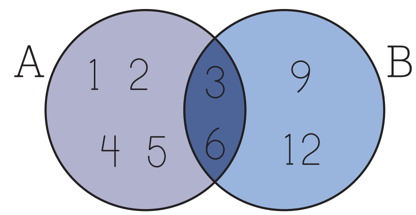
If two or more sets are joined together, it is called a union. The union of multiple sets includes all the elements in each set. This symbol is used to represent a union: ∪.

The intersection of two or more sets includes the elements the sets have in common. This symbol is used to represent an intersection: ∩.

A ***Venn diagram*** (pictured at the right) is a diagram that shows relationships between sets. The area where the circles overlap is the intersection of the sets. It shows what elements the sets have in common.



Example:



A = {1, 2, 3, 4, 5, 6}   B = {3, 6, 9, 12}

A∪B
A **or** B
A∪B = {1, 2, 3, 4, 5, 6, 9, 12}

A∩B
A **and** B
A∩B = {3, 6}

Practice

1. Write whether the following sets are empty, finite, or infinite.

a. A = {multiples of 5} ____________

b. B = {even numbers between 1 and 11} ____________

c. C = {negative numbers that are whole numbers} ____________

d. D = {perfect squares between 2 and 20} ____________

e. E = {proper fractions that are natural numbers} ____________

f. F = {natural numbers that are odd} ____________

g. G = {factors of 100} ____________

2. Write each set. The first one is given as an example.

a. Set A is a set of odd numbers greater than 14. A = {15, 17, 19, 21, ...}

b. Set B is a set of the first five positive multiples of 12. ____________

c. Set C is a set of integers less than -5. ____________

d. Set D is a set of whole numbers less than 4. ____________

e. Set E is a set of natural numbers greater than 12 and less than 15. ____________

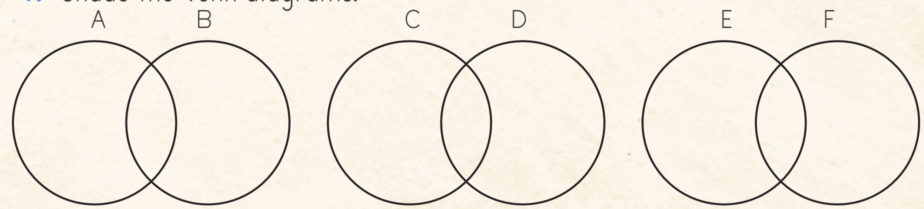
3. Fill in the information and answer the questions about Set A, which is a set of the first six positive multiples of 7.

A = {____________}

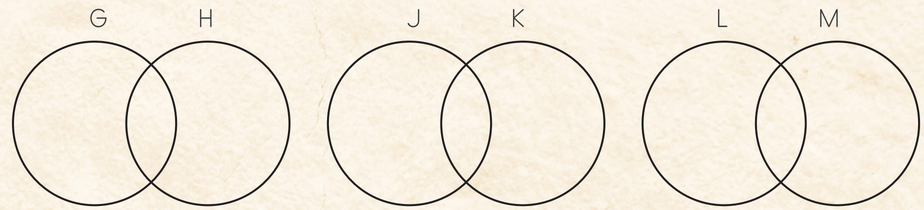
Is 14 an element of Set A? ________ Is 25 an element of Set A? ________

Is 49 an element of Set A? ________ Is 7 an element of Set A? ________

4. Shade the Venn diagrams.

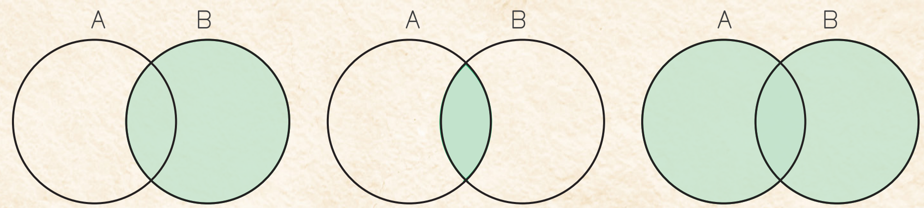


Shade Set A. Shade Set D. Shade E∪F.



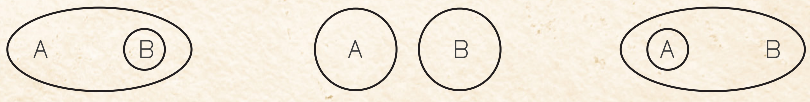
Shade G∩H. Shade elements that are in Set K but not Set J. Shade elements that are in Set L but not Set M.

5. Match.



A∩B Set B A∪B

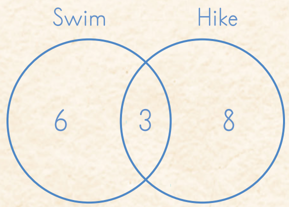
6. Match.



A∩B = Ø A is a subset of B. B is a subset of A.

7. Use the Venn diagrams to answer questions about Erik's family.

At the last family reunion, Erik asked his cousins whether they like to swim or hike. The totals are shown in the Venn diagram.



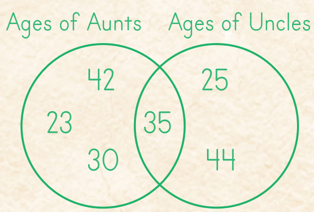
How many cousins like to swim? ______

How many cousins like to hike? ______

How many cousins like to swim and hike? ______

How many cousins were surveyed? ______

Here are the ages (in years) of all Erik's aunts and uncles.



How many aunts does Erik have? ______

How many uncles does Erik have? ______

One aunt and one uncle are the same age. What is that age? ______

8. Create Venn diagrams using the information given. Then find the unions and intersections of the sets.

A = {1, 5, 25} B = {5, 10, 15, 20, 25}

A∪B = ________________________

A∩B = ________________________

C = {6, 7, 8, 9} D = {-6, -7, -8, -9}

C∪D = ________________________

C∩D = ________________________

E = {2, 4, 6, 8} F = {4, 8, 12, 16}

E∪F = ________________________

E∩F = ________________________

Review

1. Write each number in the appropriate category (or categories). If a number does not fit into any category, cross it out.

-5	92	41	$\frac{5}{7}$	-3.3	0
-74	-60	0.4	122	π	$\frac{9}{17}$

Natural Numbers	Whole Numbers	Integers

2. Divide.

$12\overline{)7}$ $22\overline{)9}$ $16\overline{)35}$

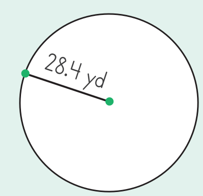
$4 \div 15$ $15 \div 8$ $5 \div 11$

3. Fill in the information about the circle below.

radius = __________ diameter = __________

circumference ≈ ______________

area ≈ _________________



Lesson 99

TIME ZONES

- Complete today's *Math 5 Mental Math Map Mysteries* activity.
- Watch the video lesson and/or read the mini lesson.

Video Lesson

Chichén Itzá

1:00 PM

Machu Picchu

______

Scan the QR code or watch the video lesson on goodandbeautiful .com/Math5.

Mini Lesson

There are 24 hours in one day, and the earth rotates 360° in a 24-hour period. This means the earth rotates 15° each hour.

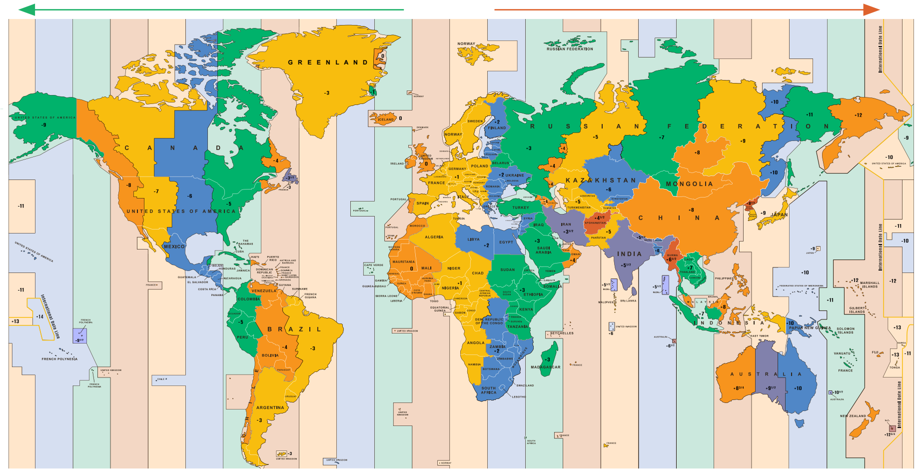
$$\frac{360^\circ}{24 \text{ hr}} \rightarrow 15^\circ \text{ rotation each hour}$$

In 1884 a conference was held to standardize time throughout the world, and the earth was divided into 24 time zones. A time zone is an area of land, and within each time zone, the time is the same. Time zones are spaced 15° apart, and there is a one-hour time difference from one time zone to the next. Moving to the east, each time zone is one hour ahead. Moving to the west, each time zone is one hour behind.

World Time Zones Map

Subtract one hour for each time zone.

Add one hour for each time zone.



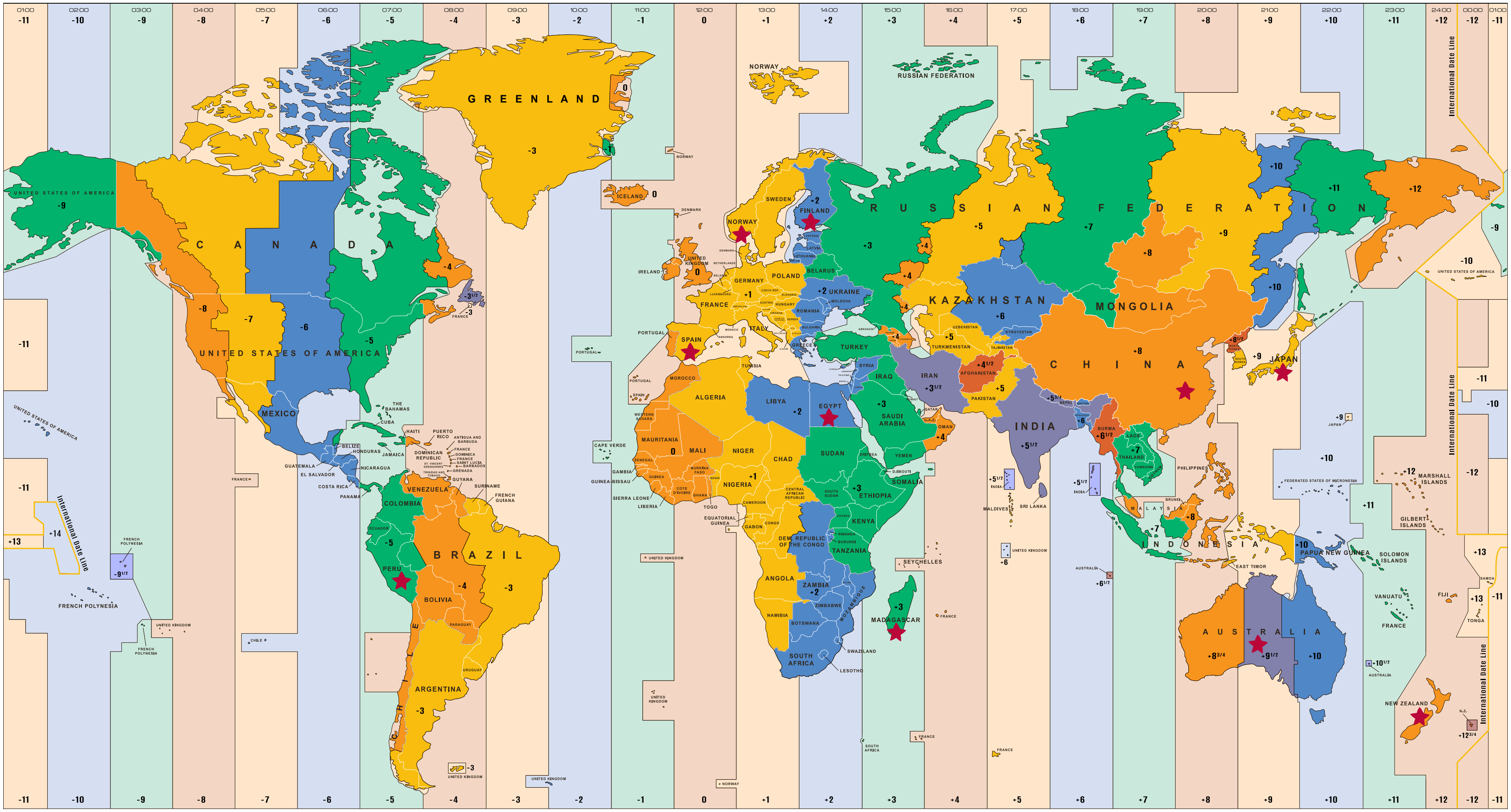
Time zones are measured from a starting point called the prime meridian. The prime meridian is located at 0° longitude. Longitude is the measurement east or west of the prime meridian.

On the opposite side of the world, at 180° longitude, is the international date line. There is a 12-hour time difference between the prime meridian and the international date line. The international date line is a boundary that marks the change from one calendar day to the next. Crossing the international date line going to the west, it is one day later. Crossing it going to the east, it is one day earlier.

Practice

★ Hint: Look for the red stars to find the countries and cities named in the questions.

World Time Zones Map



1. How many time zones are there in the world? ____________

2. What is the time difference from one time zone to the time zone next to it? ____________

3. If it is 4:30 PM in Spain, what time is it in Finland? ____________

4. If it is 11:25 PM on Thursday in Norway, what time and day is it in China? ________________

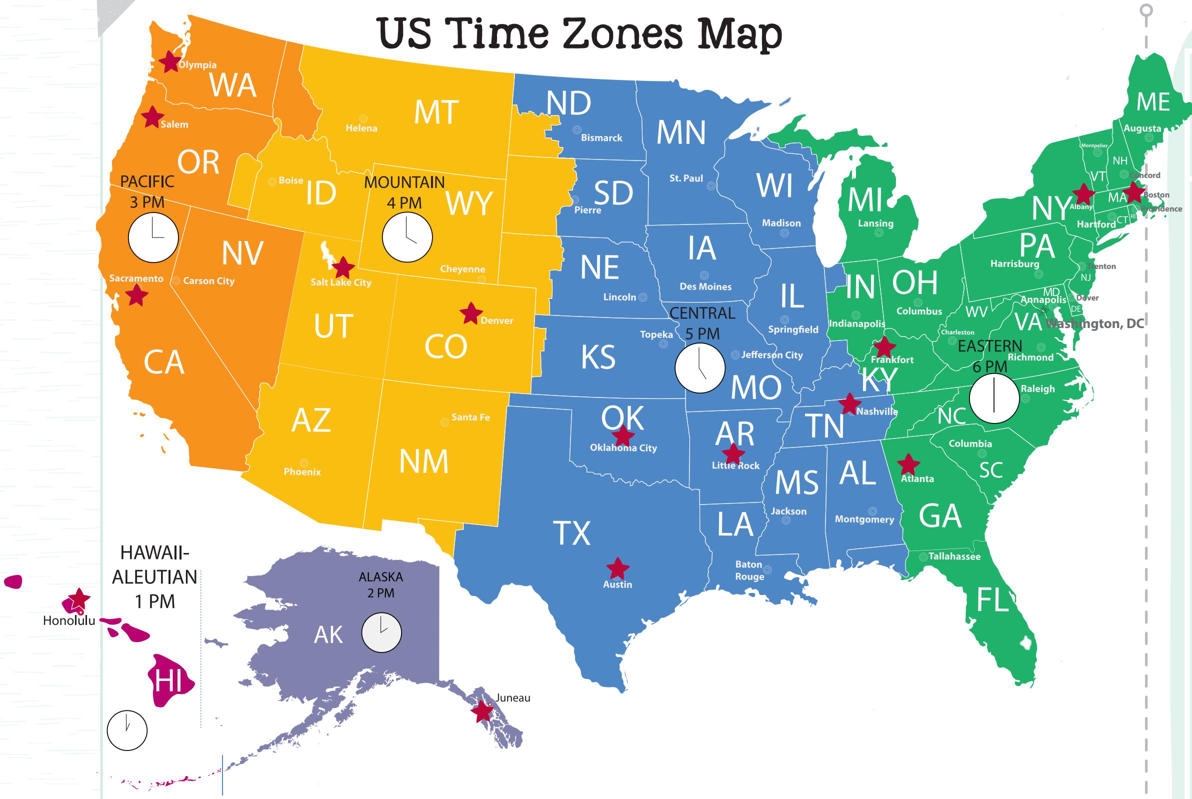
5. If it is 6:03 PM in Japan, what time is it in Egypt? ____________

6. If it is 8:47 AM in Peru, what time is it in Madagascar? ____________

7. How many time zones are there in Australia? ____________

8. If you traveled from New Zealand heading east across the international date line on Tuesday, what day would it be once you passed the international date line? ____________

US Time Zones Map



9. How many different time zones does the United States have? __________

10. If it is 2:38 PM in Olympia, WA, what time is it in the following cities?

Oklahoma City, OK __________ Denver, CO __________ Boston, MA __________

11. If it is 11:45 AM in St. Paul, MN, what time is it in the following cities?

Honolulu, HI __________ Albany, NY __________ Austin, TX __________

12. If it is 8:24 AM in Atlanta, GA, what time is it in the following cities?

Nashville, TN __________ Juneau, AK __________ Sacramento, CA __________

13. If it is 12:55 PM in Salt Lake City, UT, what time is it in the following cities?

Frankfort, KY __________ Salem, OR __________ Little Rock, AR __________

Review

1. Continue dividing until there is a remainder of zero or a repeating decimal. Write repeating decimals with a bar.

$2.3\overline{)4.83}$ $0.08\overline{)0.6024}$

$0.33\overline{)1.3629}$ $0.6\overline{)7.7}$

2. Use reciprocals to divide.

$\frac{12}{7} \div \frac{4}{7} =$ $\frac{23}{30} \div \frac{4}{5} =$ $\frac{45}{46} \div \frac{9}{23} =$

3. Create a Venn diagram for the sets below. Then fill in the blanks.

R = {7, 8, 9, 10, 11} S = {2, 4, 6, 8, 10}

$R \cap S =$ __________________

$R \cup S =$ __________________

4. Subtract.

$\frac{7}{9} - \frac{3}{4} =$ $4\frac{5}{6} - 1\frac{4}{5} =$ $7 - 0.052 =$

5. Compare the fractions by writing <, >, or = between them.

$\frac{5}{7}$ ◯ $\frac{22}{35}$ $\frac{13}{15}$ ◯ $\frac{5}{6}$ $\frac{5}{12}$ ◯ $\frac{4}{9}$

REFERENCE GUIDE

DIVISIBILITY RULES

A number is divisible by . . .

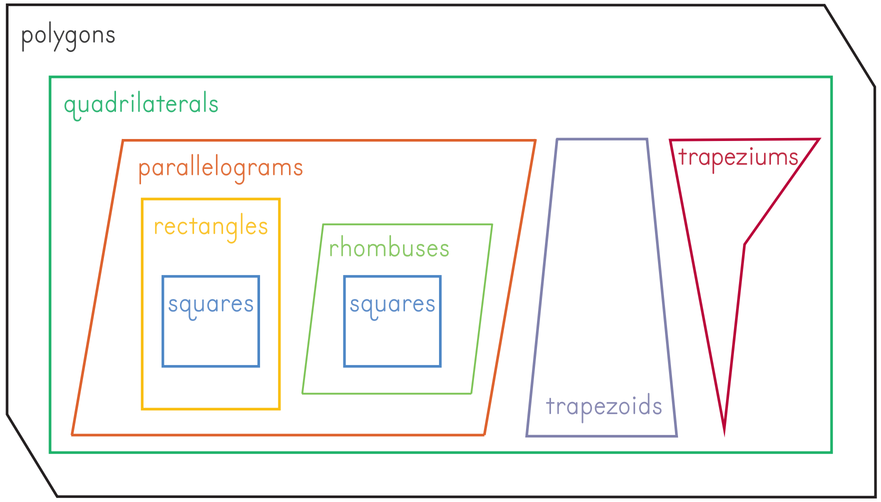
- **2** if it is an even number.
- **3** if the sum of the digits is divisible by 3.
- **4** if the last two digits of the number are divisible by 4.
- **5** if it ends in either 0 or 5.
- **6** if it is divisible by both 2 and 3.
- **9** if the sum of the digits is divisible by 9.
- **10** if the number ends in 0.

Mean, Median, Mode, and Range

Hey, diddle diddle, the median's the middle.
You add then divide for the mean.
The mode is the one that you see the most,
And the range is the difference between.

Order of Operations

Quadrilateral Classification



Properties

Commutative Property

$2 + 3 = 3 + 2$

$2 \times 3 = 3 \times 2$

Associative Property

$(2 + 3) + 4 = 2 + (3 + 4)$

$(2 \times 3) \times 4 = 2 \times (3 \times 4)$

Distributive Property

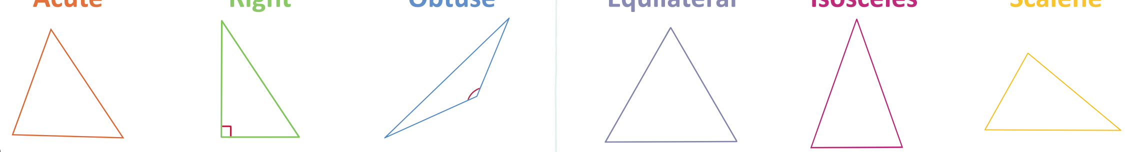
$4(3 + 2) = (4 \times 3) + (4 \times 2)$

$4(3 - 2) = (4 \times 3) - (4 \times 2)$

ANGLE CLASSIFICATION

acute	right	obtuse	straight
less than 90°	90°	between 90° & 180°	180°

Triangle Classification **by Angles** **by Sides**



A triangle with . . .

Acute	Right	Obtuse	Equilateral	Isosceles	Scalene
all angles less than 90°	an angle that measures 90°	an angle that is greater than 90°	three sides of equal length	two sides of equal length	no sides of equal length

REFERENCE GUIDE

CONVERSIONS

US Customary System

Length

1 ft = 12 in

1 yd = 3 ft = 36 in

1 mi = 1,760 yd = 5,280 ft = 63,360 in

Weight

1 lb = 16 oz

1 tn = 2,000 lb

Capacity

3 tsp = 1 Tbsp

Metric System

kilo- means 1,000

hecto- means 100

deka- means 10

BASE UNIT means 1

deci- means 0.1

centi- means 0.01

milli- means 0.001

Multiply by powers of 10 to convert to a smaller unit.

Divide by powers of 10 to convert to a larger unit.

Common Conversions

$\frac{1}{2}$ = 0.5 = 50%

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

$\frac{1}{3}$ = $0.\overline{3}$ = $33.\overline{3}$%

$\frac{3}{4}$ = 0.75 = 75%

$\frac{2}{3}$ = $0.\overline{6}$ = $66.\overline{6}$%

$\frac{1}{5}$ = 0.2 = 20%

$\frac{1}{8}$ = 0.125 = 12.5%

Formulas

Area

rectangle: $A = \ell w$

triangle: $A = \frac{bh}{2}$

circle: $A = \pi r^2$

Volume

rectangular prism: $V = \ell wh$

cylinder: $V = \pi r^2 h$

Temperature

$F = 9C \div 5 + 32$

$C = (F - 32) \times 5 \div 9$

pi (π) ≈ 3.14 ≈ $\frac{22}{7}$

circumference of a circle: $C = \pi d$ $C = 2\pi r$

Perfect Squares and Square Roots

$1^2 = 1$	$9^2 = 81$	$\sqrt{1} = 1$	$\sqrt{81} = 9$
$2^2 = 4$	$10^2 = 100$	$\sqrt{4} = 2$	$\sqrt{100} = 10$
$3^2 = 9$	$11^2 = 121$	$\sqrt{9} = 3$	$\sqrt{121} = 11$
$4^2 = 16$	$12^2 = 144$	$\sqrt{16} = 4$	$\sqrt{144} = 12$
$5^2 = 25$	$13^2 = 169$	$\sqrt{25} = 5$	$\sqrt{169} = 13$
$6^2 = 36$	$14^2 = 196$	$\sqrt{36} = 6$	$\sqrt{196} = 14$
$7^2 = 49$	$15^2 = 225$	$\sqrt{49} = 7$	$\sqrt{225} = 15$
$8^2 = 64$		$\sqrt{64} = 8$	

Fraction $\frac{9}{20}$ → Divide the numerator by the denominator. → **Decimal** 0.45 → Move the decimal point two places to the right and write a percent sign. → **Percent** 45%

Write an equivalent fraction with a denominator of 100. The numerator is the percent.

Fraction $\frac{85}{100} = \frac{17}{20}$ ← The digits to the right of the decimal point are the numerator; the place value of the last digit is the denominator. ← **Decimal** 0.85 ← Move the decimal point two places to the left and don't write a percent sign. ← **Percent** 85%

Write the percent over one hundred.

Place Value

Billions			Millions			Thousands			Ones			Decimals			
Hundred Billions	Ten Billions	Billions	Hundred Millions	Ten Millions	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths	Ten Thousandths

goodandbeautiful.com

SKU 580