CARROLL MIDDLE SCHOOL

Summer Math Activities

For Students Entering Grade 8

Name: _____

You've learned SO much this year! It is important that you keep practicing your mathematical knowledge over the summer to be ready for 8th grade. In this document, you will find a calendar of activities for the months of July and August. Once you have completed an activity, have a family member initial in the box on the calendar. Use your math journal (a spiral notebook) to record and show all of your work.

DIRECTIONS:

- Create a personal and fun Math Journal in a spiral notebook. Be creative and decorate the first page with markers or crayons or other material to show math in your world.
- Each journal entry should:
    - Have the week number and the word problem or activity number
    - Have a clear and complete answer that explains your thinking
    - Be neat and organized
- Choose 5 of the 6 required activities and include them in your journal
- The additional worksheet pages included in this document should be printed and taped/stapled into your Math Journal

Try to play a board game or card game at least one day each week. Write about the game in your journal. Be sure to title the page with the name of the game. Here are some suggestions of games for you to play: Monopoly, Stratego, Othello, Connect Four, Chess, War, Battleship, Risk, Mancala, Yahtzee and Mastermind.

Don't forget to bring your journal, July and August calendars, and required activities to school on the first day of eighth grade. Your new teacher will be so proud of your summer math work!
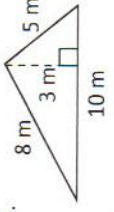
Kids' Information Page

We're so proud of you for taking the time to work on math over the summer!

Here are some helpful hints for success:

☺ It's ok to have parents and other adults help you!

☺ Find a quiet work space where you can get organized and stay focused.

☺ Pay close attention to the examples and vocabulary.

☺ Choose a unit that you like, and work through it completely before moving on to another unit.

   o Try to complete at least 1 worksheet per day.

   o Complete all of the problems on each worksheet.

☺ Calculators may ONLY be used when you see this symbol:

☺ Remember to do a little work each week. DO NOT wait until the week before school starts to complete your packet!

☺ The packet should be returned to your math teacher during the first week of school.

☺ You can access your textbook online. See the Textbook Navigation Page for information.

Have fun & we'll see you in August!

	WEEK 1 RATIOS & PROPORTIONS	WEEK 2 PERCENTS	WEEK 3 GEOMETRY	WEEK 4 PROBLEM SOLVING

WEEK 1 — RATIOS & PROPORTIONS

In homeroom 9, there are 12 boys and 14 girls. Write a ratio for each:
1. girls to boys
2. girls to total number of students
3. boys to total number of students

4. $\dfrac{20}{x} = \dfrac{4}{9}$

5. $\dfrac{8}{30} = \dfrac{x}{45}$

6. $\dfrac{x}{7} = \dfrac{3}{5}$

7. For the 2010 season, the Essex Bees reported a home attendance of 207,000. They estimated that their attendance was in the ratio of 8 men to 7 women to 5 children. Based on this ratio, how many men attended home games?

8. A map uses a scale of 1 cm = 5½ miles. In actual distance, the entrances to two parks are 24 ¾ miles apart. How far apart are they on the map?

9. Claudia has a cake recipe that requires 4 cups of flour, 4 eggs, 1 cup of sugar, 2 cups of milk and ½ cup of cocoa powder. Claudia only has 3 eggs. She decides to alter the recipe to use only 3 eggs. How much of each ingredient will she need?

WEEK 2 — PERCENTS

1. What is 40% of 680?
2. What is 7% of 400?

3. 24 is what percent of 480?
4. What percent of 800 is 2?

5. 30% of what number is 165?
6. 72 is 15% of what number?

7. John bought a skateboard that originally cost $375. He used a coupon for 25% off. If he paid 6% sales tax, how much did he spend on the skateboard?

8. A realtor earns a commission of 5.5% on the sale of a house. If the commission the realtor earned was $22,000, for how much was the house sold?

WEEK 3 — GEOMETRY

List at least 3 characteristics for each polygon.
1. obtuse triangle
2. parallelogram
3. trapezoid
4. scalene triangle

Find the area and perimeter for each polygon.

5. [triangle: 8 m, 3 m, 5 m, 10 m]

6. [trapezoid: 1.7 in, 3.2 in, 9 in]

7. A contractor pours a sidewalk that is 4 in deep, 1 yard wide and 20 yards long. How many cubic yards of concrete will be needed?

8. Justin wanted to plant a rectangular vegetable garden. He bought 60 ft of fencing to enclose his garden. Justin wants to enclose the maximum area for his garden. What dimensions should Justin use for his vegetable garden?

9. Anthony is designing a circular ice skating rink. He wants to build the rink so that 12 laps around the outside rail will equal a distance of 1 mile. To the nearest foot, what length should he use for the radius of the rink? (Hint: 1 mile = 5280 ft)

WEEK 4 — PROBLEM SOLVING

1. On Bill's football team, ⅓ of the players walk to practice and 25% are driven by their parents. The remaining 15 players take the bus. How many members are on the football team?

2. Friday was spirit day at Hill Middle School. Ms. Wong's class has 20 students, and 14 of them participated. Mr. Locke's class has 28 students and 21 participated. Which class had the higher percent of students participating?

3. Mrs. Lang's class has 25 students. At least how many students would have to participate for her class to win the spirit award?

4. Two radio stations are playing the number-one hit song. WBCU plays the song every 24 minutes. WFSC plays the song every 9 minutes. Both stations play the song at 1:30 PM. When is the next time the stations will play the song at the same time?

5. A farm has a vertical cylindrical tank that has an inside diameter of 2.5 feet. The depth of the oil in the tank is 2 feet. If 1 cubic foot of space holds 7.48 gallons, about how many gallons of oil are in the tank?

6. Joey bought a plot of land measuring 1 square mile, on which he plans to grow blueberries. He hires 346 people to plant seedlings. It takes about 20 seconds to plant each seedling, and each seedling requires 1.5 ft² of land. How many square feet of land can the 346 workers plant each minute?

7. About how much time will it take to plant the entire plot of land?

July

MONTH OF AUGUST *Parent/guardian please initial each box after completion, work is to be completed in attached math jou

Month of July *Parent/Guardian please initial each box after completion, work is to be complete in in attached math journal.

WEEK 1 RATIOS & PROPORTIONS	1. 2. 3.	4. 5. 6.	7.	8.	9.
WEEK 2 PERCENTS	1. 2.	3. 4.	5. 6.	7.	8.
WEEK 3 GEOMETRY	1. 2. 3.	5. 6.	7.	8.	9.
WEEK 4 PROBLEM SOLVING	1.	2. 3.	4.	5.	6. 7.

5

WEEK 1 — PROBABILITY

1. A bag contains fifty cards numbered 1 to 50. What is the probability of drawing a card from the bag that is numbered with a multiple of four?

2. Mrs. Jensen wants to visit Rome, Barcelona, Paris, and Zurich. She can visit the cities in any order. How many different orders can Mrs. Jensen plan her trip?

3. One bucket contains five blue marbles, seven green marbles, and eight red marbles. Another bucket contains five red marbles and five black marbles. Without looking, a marble is taken from each bucket. What is the probability that both marbles will be red?

4. The forecast calls for a 30% chance of snow today and a 40% chance of snow tomorrow. What are the chances that it will snow two days in a row?

5. Sharon is planting tulip bulbs in her garden. In the catalog she sees a disclaimer that there is a $\frac{1}{15}$ probability that a bulb will not flower. If Sharon plants 90 bulbs, how many tulips can she expect to see in her garden?

6. If she wants to have 90 flowers, how many bulbs should she order?

WEEK 2 — SIGNED NUMBERS

1. $-5 + -8 =$
2. $-17 + 9 =$
3. $14 + -31 + -42 =$
4. $-24 + 35 + 9 =$
5. $37 + -9 =$
6. $-5 - (-8) =$
7. $-12 - 19 =$
8. $15 - 23 =$
9. $45 - (-17) =$
10. $7 - (-3) - 12 =$
11. $-9 \cdot (-4) =$
12. $-7 \cdot (-2) \cdot (-8) =$
13. $-41 \cdot (-15) =$
14. $9.2 \cdot (-1.3) =$
15. $-0.25 \cdot (-0.8) =$
16. $-42 \div -6 =$
17. $-82 \div 5 =$
18. $-108 \div -12 =$
19. $10 \div -0.5 =$
20. $2.4 \div -6 \div -0.4 =$
21. $-81 + 3(6 - 8) =$
22. $\dfrac{5 - (-17)}{-2} =$
23. $(-5)(-3) - (4)(-7) =$
24. $-7(9 + 23) =$
25. $-8.35 - (-4.5)(2) =$

WEEK 3 — EQUATIONS

Solve each equation.
1. $x + 5.2 = 19$
2. $7.8 = x - 11$
3. $49 = x + 63$
4. $x - \frac{3}{4} = \frac{1}{2}$

Solve each equation.
5. $24 = 0.6x$
6. $\dfrac{x}{9} = 18$
7. $\frac{2}{3}x = 40$
8. $4.5 = \dfrac{x}{3}$

Solve each equation.
9. $4x + 11 = 51$
10. $72 = 8x - 16$
11. $\dfrac{x}{7} + 13 = 20$
12. $4 = \dfrac{x}{12} - 11$

13. Joley is paid 1.5 times her normal hourly rate for each hour she works over 40 hours in a week. Last week she worked 52 hours and earned $707.60. What is her normal hourly rate?

14. Gina bought ⅔ lb of coffee that cost $4.50/lb, ¾ lb of coffee that cost $5.20/lb, and ⅛ lb of coffee that did not have a price marked. Her total bill was $8.18. What was the price per pound for the 3rd type of coffee?

WEEK 4 — PROBLEM SOLVING

1. The sum of 3 numbers is 79. The second number is 9 times the first, and the third number is 3 more than the second. Find the numbers.

2. The Acme storage facility measures 450 ft by 300 ft. If 65% of the floor space is covered, how many square feet are not covered?

3. Last weekend, Michael drove to his friend's house. When he left, he noticed that the fuel gauge in his car indicated that his gas tank was ¾ full. When he returned home, the fuel gauge in his car indicated that his gas tank was ⅛ full. If the gas tank holds 24 gallons, how many gallons did Michael use on his drive?

4. A car gets 20 miles per gallon in the city and 28 miles per gallon on the highway. How many gallons of gasoline were used if this car made a 400 mile trip that is 70% highway driving and the rest city driving?

5. At Joe's Pizzeria, each pizza cost 11¢ per square inch. Joe's Pizzeria makes a 12 inch square pizza and a round pizza with a diameter of 12 inch. Which pizza is more expensive? How much more expensive is it?

WEEK 1 PROBABILITY	1..	2.	3.	4.	5. 6.
WEEK 2 SIGNED NUMBERS	1. 2. 3. 4. 5.	6. 7. 8. 9. 10.	11. 12. 13. 14. 15.	16. 17. 18. 19. 20.	21. 22. 23. 24. 25.
WEEK 3 EQUATIONS	1. 2. 3. 4.	5. 6. 7. 8.	9. 10. 11. 12.	13.	14.
WEEK 4 PROBLEM SOLVING	1.	2.	3.	4.	5.

Activity 1:

Measure the perimeter of your kitchen. Draw a rough sketch of your kitchen below. Label the length and width of each side of the room. Then calculate the perimeter and area of the kitchen.

Rough Sketch:

Perimeter:

Area:

Activity 2:

Measure the height of each of your family members using metric measures (**centimeters** and **meters**). Write the names of each family member below and their height. Then order your family members from tallest to shortest.

Family Member	Height

Order (from tallest to shortest):

Activity 3

Decide on a recipe you would like to cook or bake. Rewrite the recipe **tripling** it. How much of each ingredient do you need now?

Ingredients	Amount Needed

Activity 4

Look through a grocery store flyer. Find the cost of 3 different items that are sold by weight (fruits, vegetables, deli meats). Decide with a family member how much of each item you need for your family. How much will each item cost? What will be the total cost for all 3 items?

Item	Amount Needed	Cost	Total Cost Per Item
Total			

Activity 5

Use a package of M&Ms to determine the probability of picking out each color from the bag. Count and list the different colors. Then list the probability of picking out each color if they were all put back in the bag together. Write the probability as a fraction, and then use

a calculator to write it as a percent.

Color	Number	Probability as a Fraction
TOTAL		

Activity 6

Keep track of the time you spend on different activities for one day (24 hours). Make a circle graph showing how you spent your day.
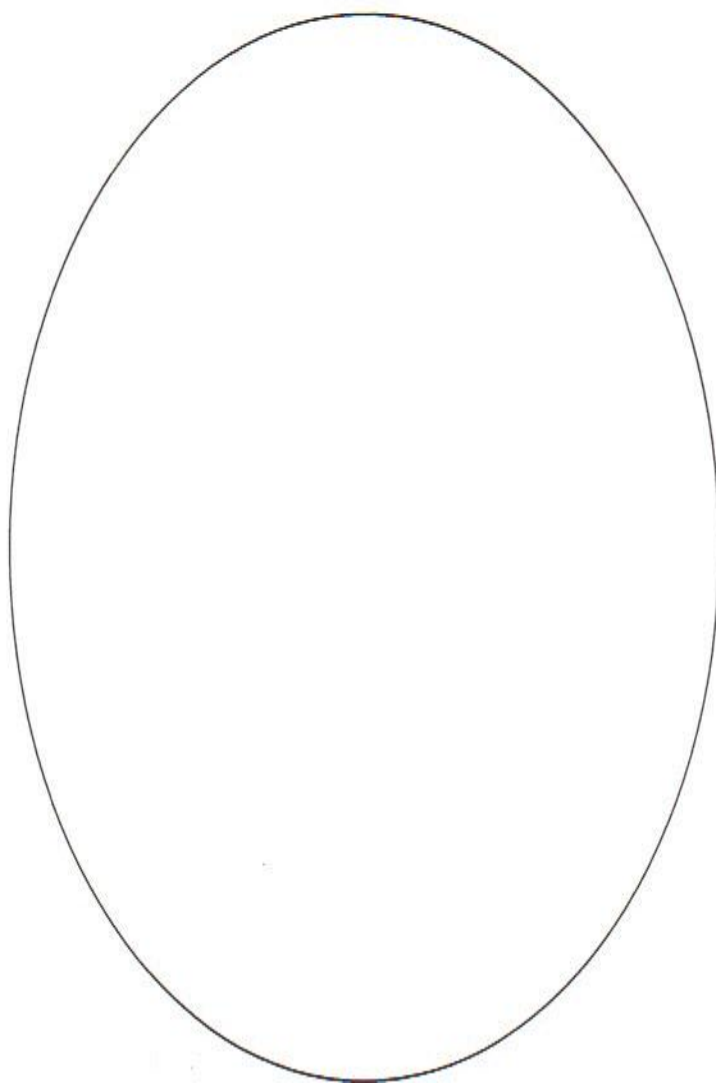
Level 8 (Pre-Algebra)

Chapter/Section in Text	FCPS Indicator Number	Content Standard/Indicators
	MA.800.10	**KNOWLEDGE of ALGEBRA, PATTERNS and FUNCTIONS**
3-3; 3-4; 3-5	MA.800.10.70	Identify equivalent equations.
	MA.800.20	**KNOWLEDGE of GEOMETRY**
10-1	MA.800.20.05	Identify and describe relationships between angles formed when parallel lines are cut by a transversal.
9-5	MA.800.20.20	Use the Pythagorean Theorem.
9-5	MA.800.20.25	Determine whether 3 given side lengths form a right triangle.
10-4	MA.800.20.30	Draw quadrilaterals given their whole number dimensions in in/cm of angle measurements.
	MA.800.30	**KNOWLEDGE of MEASUREMENT**
10-7	MA.800.30.05	Estimate and determine the circumference or area of a circle.
10-8	MA.800.30.10	Estimate and determine area of composite figures.
11-2	MA.800.30.15	Estimate and determine the volume of a cylinder.
6-2; 6-3	MA.800.30.30	Use proportions, scale drawings (with scales as whole numbers), or rates to solve measurement problems.
	MA.800.40	**KNOWLEDGE of STATISTICS**
	MA.800.40.15	Interpret circle graphs.
	MA.800.40.05	Interpret tables.
	MA.800.50	**KNOWLEDGE of PROBABILITY**
12-9	MA.800.50.05	Describe the difference between independent and dependent events.
6-9	MA.800.50.15	Express the probability of an event as a fraction, a decimal or a percent.
12-9	MA.800.50.20	Determine the probability that a second event is dependent upon a first event of equally likely outcomes and express the probability as a fraction, decimal, or percent.
	MA.800.60	**KNOWLEDGE of NUMBER RELATIONSHIPS and COMPUTATION**
9-1	MA.800.60.35	Estimate the square roots of whole numbers.
6-2; 6-3; 6-5	MA.800.60.50	Solve problems using proportional reasoning.

Textbook Navigation Page

To get to the online version of the book:

1.) Go to http://www.glencoe.com/sec/math/prealg/prealg05/index.php4/md

2.) Click Online Student Edition
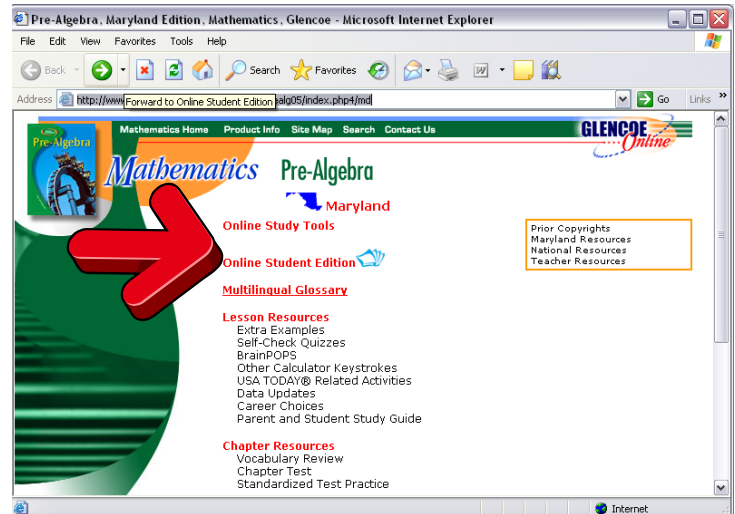
3.) Enter the following information:

Username: PREALG05

Password: ph5Ves7a
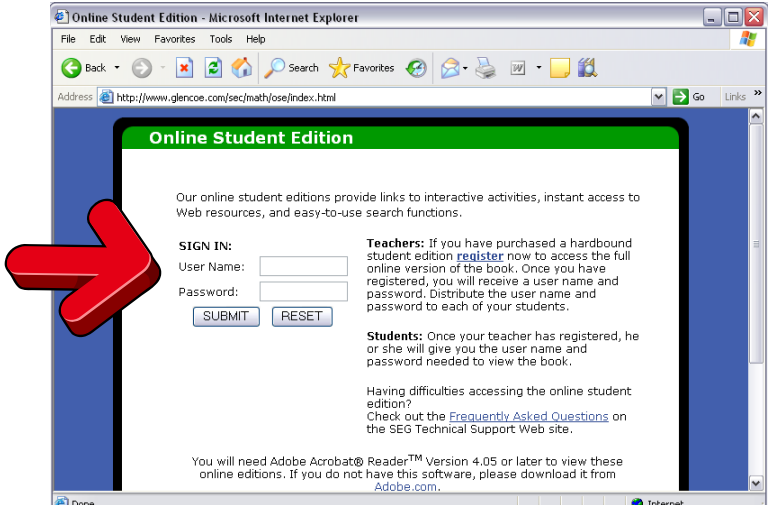
4.) Click on Table of Contents – this will bring up each section of the book. Click on the Section, followed by the chapter you want. Continue to use the Bookmark side bar to navigate through the book and its pages.
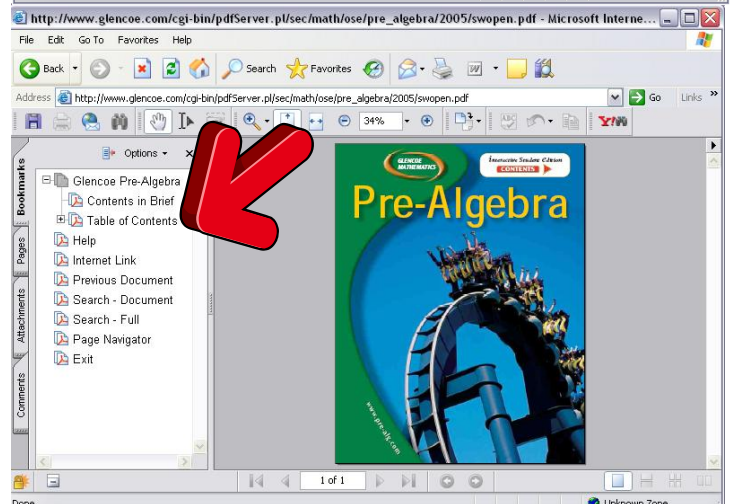
**Note: You can not print the book. It is copyrighted by the publisher. This is for viewing purposes only.

Unit: Knowledge of Algebra, Patterns, and Functions   **Textbook Section: 3-3, 3-4, 3-5**
Objective: Identify Equivalent Equations
Example:
Which equation is equivalent to 3x + 2 = 8?

A) x + 4x = 5   B) x + 2 = 6   C) 6x + 5 = 11   D) 4x – 3 = 5

STRATEGY: Solve the given equation and each of the equation choices and compare the solutions.
Step 1: Solve the given equation.   3x + 2 = 8   Subtract 2 from both sides

$$3x = 6 \quad \text{Divide both sides by 3 (or multiply by } \tfrac{1}{3} \text{)}$$

$$x = 2 \quad \text{An equivalent equation MUST have a solution of 2.}$$

Step 2: Solve Choice A.   x + 4x = 5   Step 3: Solve Choice B.   x + 2 = 6
                                             5x = 5   x = 4
                                              x = 1

Step 4: Solve Choice C.   6x + 5 = 11   Step 5: Solve Choice D.   4x – 3 = 5
                                             6x = 6   4x = 8
                                              x = 1   x = 2
SOLUTION: The equation that is equivalent to 3x + 2 = 8 is 4x – 3 = 5, Choice D.

|	
1.) Solve: 7x + 3 = 24	**2.)** Solve: $7 + \dfrac{h}{3} = 5$
3.) Which of the following equations is equivalent to 30 = 5d + 6 – 2d ? A) 30 = 7d + 6 B) 10 + 20 = 3d – 6 C) 35 + 5 = 3d + 6 D) 30 = 3d + 6	**4.)** Which of the following equations is equivalent to 6 = 2x + 5 ? A) 4x – 6 = 6x + 5 B) 8x = 6x + 5 C) 8x + 12 = 12x + 10
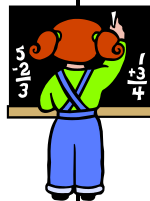
5.) Are the two equations given equivalent?
 	
       50 = 6 + –11c
 	
     6c – 14 + 5c + 8 = –50
	6.) Which of the following equations is **not** equivalent to the equation below?
	           8x + 5x – 5 = 12 + 9
	
	 A) x = 2 B) 13x – 5 = 21
	
	 C) 13x = 26 D) 13x = 21

Unit: Knowledge of Geometry   **Textbook Section: 10-1**
**Objective:** Identify and describe relationships between angles formed when parallel lines are cut by a transversal.
Example:
- **Interior Angles** – lie inside the parallel lines
                - Angles 3, 4, 5, 6 are INTERIOR angles
- **Exterior Angles** – lie outside the parallel lines
                - Angles 1, 2, 7, 8 are EXTERIOR angles)
- **Vertical Angles** – angles opposite one another and are EQUAL
                - 1 & 4,   2 & 3,   5 & 8,   6 & 7 are Vertical Angles.
- **Alternate Interior Angles**
    – on opposite sides of the transversal and inside the parallel lines
    - Alternate Interior Angles are EQUAL.
    - 3 & 6……4 & 5 are Alternate Interior angles
- **Alternate Exterior Angles**
    – on opposite sides of the transversal and outside the parallel lines
    - Alternate Exterior Angles are EQUAL.
    - 1 & 8 …………2 & 7 are Alternate Exterior angles
- **Corresponding Angles**
    – in the same position on the parallel lines in relation to the transversal
    - Corresponding Angles are EQUAL.
    - 1 & 5,   2 & 6,   3 & 7,   4 & 8 are Corresponding Angles
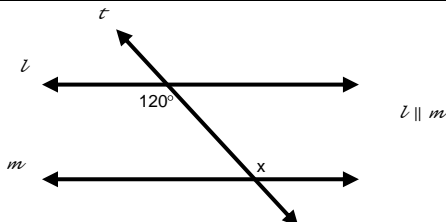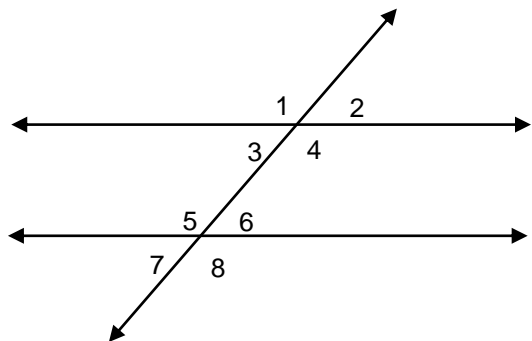

1.)

$l \parallel m$
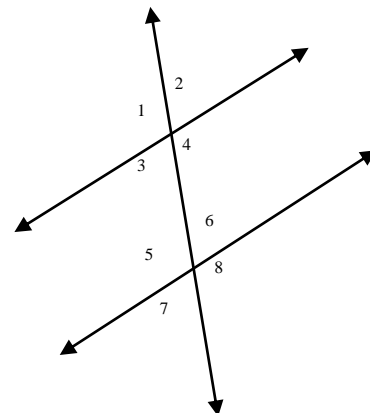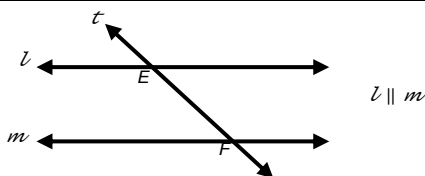
Identify the geometric relationship shown above.

2.)
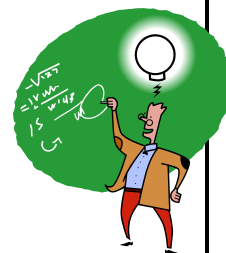

120°

$l \parallel m$

x

In the figure above, line l and m are parallel. What is the measure of x? What is the relationship between the two shown?

3.) Identify 2 alternate Interior Angles.

4.) What type of angles are 2 & 7?

5.) In the figure above, the m $\angle 4$ = 103°. Determine the measure of m $\angle 5$.

A) 113°   B) 77°   C) 107   D) 103°

6.) In the figure above, if the m $\angle 7$ = 58°. Determine the measure of m $\angle 6$.

Unit: Knowledge of Geometry   **Textbook Section: 9-5**
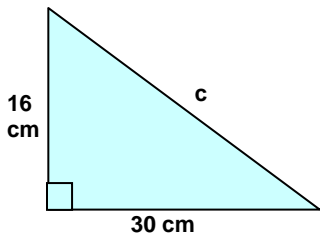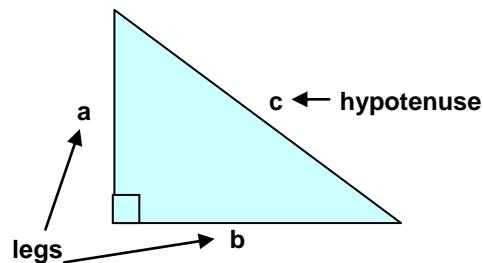**Objective:** Use the Pythagorean Theorem
Examples:

- **If a triangle is a RIGHT triangle, then the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.**
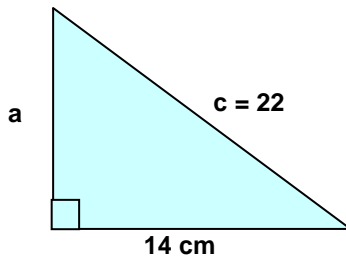
- $a^2 + b^2 = c^2$

$c \leftarrow$ **hypotenuse**

a

legs $\rightarrow$ b

16 cm

c

30 cm

$a^2 + b^2 = c^2$
$16^2 + 30^2 = c^2$
$256 + 900 = c^2$
$1156 = c^2$
$\sqrt{1156} = \sqrt{c^2}$
$34 = c$

$c = 22$

a

14 cm

$a^2 + b^2 = c^2$
$a^2 + 14^2 = 22^2$
$a^2 + 196 = 484$
$a^2 + 196 - 196 = 484 - 196$
$a^2 = 288$
$\sqrt{a^2} = \sqrt{288}$
$a = 16.97056275$
$a = 16.97 \approx 17$

You may use a calculator on this page to complete # 1- 6.
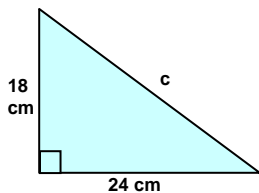
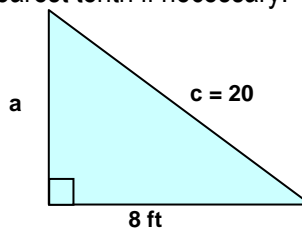|	
1.) Determine the length of the missing side. 18 cm c 24 cm	2.) Determine the length of the missing side. 15 cm c 20 cm
3.) If c is the measure of the hypotenuse, Determine the missing measure. Round to the nearest tenth if necessary. a = 10, b = ?, c = 18	4.) Determine the length of the missing side. Round to the nearest tenth if necessary. a $c = 20$ 8 ft
5.) Kristen is flying a kite. The length of the kite string is 55 feet and she is positioned 33 feet away from beneath the kite. About how high is the kite? (Hint: You may want to draw a picture to help you) A) 47 ft B) 45 ft C) 44 ft D) 40 ft	6.) Brandon rides his bike 9 miles south and 12 miles west. How far is he from the starting point of his bike ride? (Hint: You may want to draw a picture to help you set up the problem.)
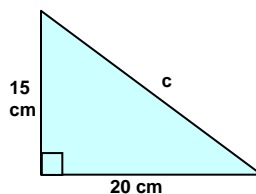
Unit: Knowledge of Geometry

Objective: Determine whether 3 given side lengths form a right triangle

Examples:

- **If a triangle is a RIGHT triangle, then the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.**
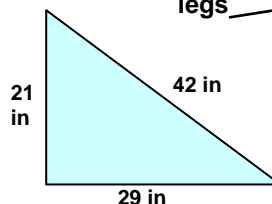
- $a^2 + b^2 = c^2$

c ← **hypotenuse**

a

legs   b

34 ft

16 ft

30 ft
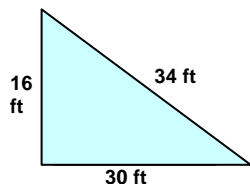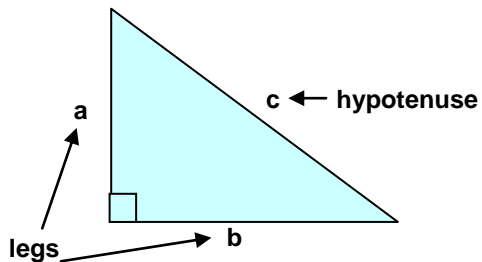
$a^2 + b^2 = c^2$
$16^2 + 30^2 = 34^2$
$256 + 900 = 1156$
$1156 = 1156$

Yes, this is a right triangle!

42 in

21 in

29 in

$a^2 + b^2 = c^2$
$21^2 + 29^2 = 42^2$
$441 + 841 = 1764$
$1282 = 1764$

NO, this is not a right triangle!

You may use a calculator to solve # 1 – 6.

1.) The lengths of three sides of a triangle are given. Determine whether each triangle is a right triangle.

a = 5, b = 8, c = 9

2.) The lengths of three sides of a triangle are given. Determine whether each triangle is a right triangle.

a = 16, b = 30, c = 34

3.) The lengths of three sides of a triangle are given. Determine whether each triangle is a right triangle.

a = 24, b = 28, c = 32

4.) The lengths of three sides of a triangle are given. Determine whether each triangle is a right triangle.

6 in, 7 in, 12 in

5.) The lengths of three sides of a triangle are given. Determine whether each triangle is a right triangle.

9 m, 12m, 15m

6.) The size of a television set is determined by the length of the diagonal of the screen. If the screen is 27 inches long, 36 high and the diagonal is 45 inches, is this a true measurement for the television set?
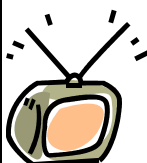
Unit: Knowledge of Geometry   **Textbook Section: 10-4**
Objective: Draw quadrilaterals given their whole number dimensions in in/cm of angle measurements
Examples:
- **A closed figure with 4 sides & 4 vertices. Such as Parallelogram, Rectangle, Square, Rhombus, etc.**
- **Can be separated into 2 triangles => Measures in a triangle = 180°**
- **Sum of measures of the angles in a Quadrilateral = 360°**

Look at the quadrilateral:
    A + B + C + D = 360°
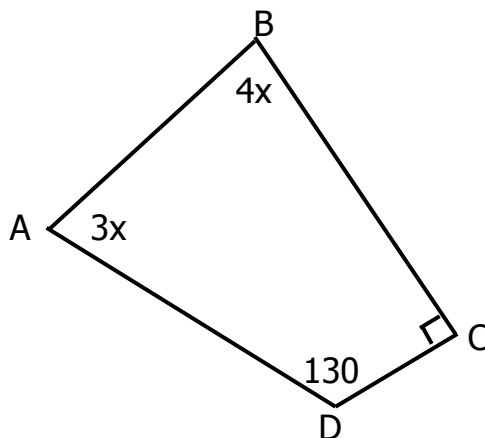 3x + 4x + 90 + 130 = 360
        7x + 220 = 360
   7x + 220 – 200 = 360 – 220
           7x = 140
       7x ÷ 7 = 140 ÷ 7
          x = 20

Value of x = 20 … So,   A = 3x   B = 4x
                A = 3(20)   B = 4(20)
                A = 60°   B = 80°

**Note: All figures are NOT drawn to scale.
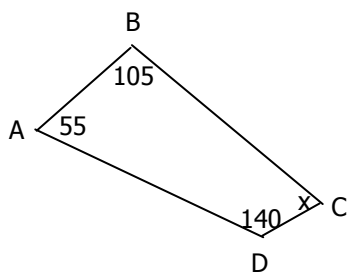
1.) Determine the measure of the missing angle.	2.) Determine the measure of the missing angles.
B 105 A 55 140 x C D	C 95 B 2x x 40 D A
3.) Tell whether each statement is *sometimes, always,* or *never* true. A rhombus is a square. _____ A square is a parallelogram. _____ A parallelogram is a square. _____ A parallelogram is a trapezoid. _____ A square is a quadrilateral. _____	**4.) Determine the value of x. Then determine the missing angle measures.** 105 130 3x 2x
5.) Determine the value of x. Then determine the missing angle measures. 2x 60 x 120	**6.) Determine the value of x. Then determine the missing angle measures.** 8x 2x 60 10x
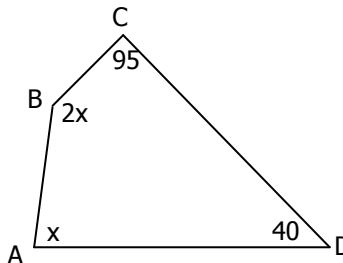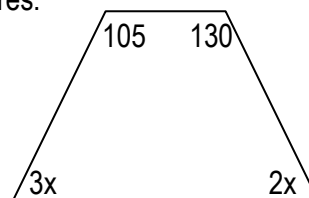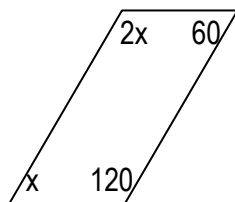
Unit: Knowledge of Measurement   **Textbook Section: 10-7**

Objective: Estimate and determine the circumference or area of a circle

Examples:

- **Circumference – Distance around the outside of a circle**

$$C = πd \quad or \quad C = 2πr$$

- **Area – amount of space inside the circle**

$$A = πr^2$$

Where

d = diameter

r = radius

Remember:

$r^2 = r \cdot r$

$π = 3.14$

$d = 2r$

$r = ½ d$

Notice:

← In the example to the left, the radius is given.

In the example to the right, the diameter is given. →

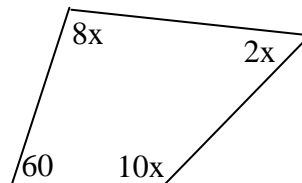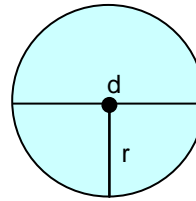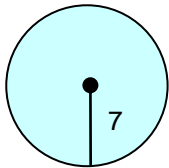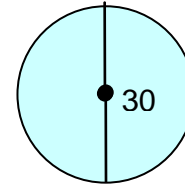| Area:	Circumference:
$A = π r^2$	$C = 2πr$
$A = 3.14 \cdot 7^2$	$C = 2 \cdot 3.14 \cdot 7$
$A = 153.86$ km	$C = 44$ km

Area: (need radius – cut diameter in half)	Circumference:
$A = π r^2$	$C = πd$
$A = 3.14 \cdot 15^2$	$C = 3.14 \cdot 30$
$A = 706.9$ km	$C = 94.2$ km

You may use a calculator to solve #1 – 6. Round all answers to the nearest hundredth if necessary.

1.) Determine the area of the circle.

r = 3 cm
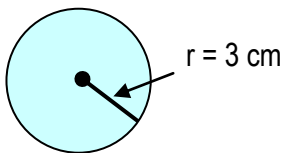
2.) Determine the circumference of the circle.

d = 7 m
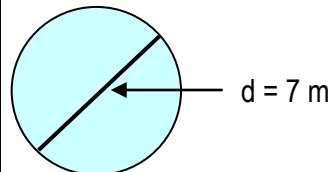
3.) Estimate the area the circle. Round given values to the nearest whole number.

3.87 mi.
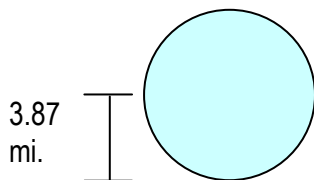
4.) Estimate the circumference the circle. Round given values to the nearest whole number.

9.87 mi.
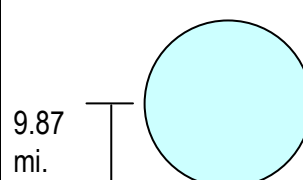
5.) You are making a pie for Pi Day (3/14). You need to determine the area of your pie as part of your assignment. You know that your pie has a diameter of 8 inches. What is the area of your pie?

6.) You are on a picnic with your friends at the beach this summer. Your friend challenges you to determine the circumference of a plate. You figure out that the radius is 4.5 inches. What is the circumference of the plate?

Unit: Knowledge of Measurement   **Textbook Section: 10-8**

Objective: Estimate and determine area of composite figures

Examples:
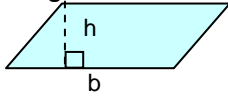
Parallelogram   **A = bh**   **Triangle**   **A = ½ bh**   **Trapezoid**   **A = ½ h (b1 + b2)**
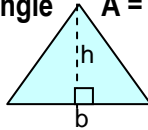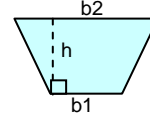
Steps: 1.   **Split figure into smaller known figures**
              2.   **Determine area of each of the smaller figures & add all areas together**
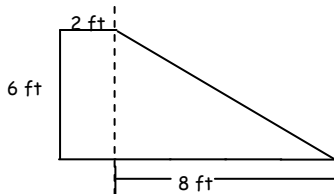
Determine the area of both shapes:

Rectangle:		Triangle: **A = ½ bh**
A = bh		**A = ½ • 8 • 6**
A = 6 • 2 = 12		**A = ½ • 48 = 24**

Add Areas: 12 + 24 = 36 ft²
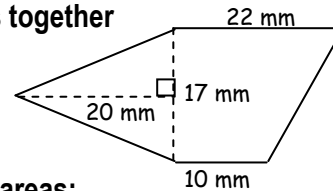
Determine the areas:

Triangle:	Trapezoid:
A = ½ bh	**A = ½ h (b1+b2)**
A = ½•17•20	**A = ½•17•(10 + 22)**
A = 17 • 10 = 170	**A = ½ •17• 32**
	A = 17 • 16 = 272

Add Areas Together: 170 + 272 = 442 mm²

You may use a calculator to solve #1 – 6.

1.) Estimate the area of this figure.

7 ft

5.8 ft.

4.3 ft.
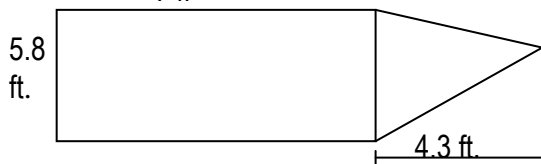
a) 54 ft.²   b) 65 ft.²   c) 170 ft.²   d) 70 ft.²

2.) Determine the area of this figure.

5 m

8 m

4 m

---

3.) Determine the area of the figure

4 ft

8 ft   7 ft

2 ft
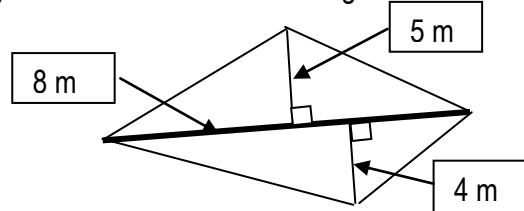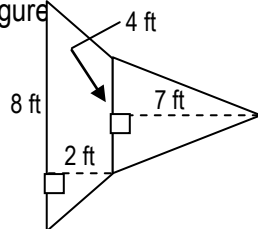
4.) Determine the area of the figure.

5 m

8 m   10 m

5 m
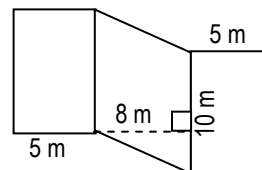
5.) You are building a garden. The following is the shape you have decided on. Determine the area of the figure in order for you to buy mulch. Round your answer to the nearest whole unit. Use π = 3.14.

14 m

6 m

10 m

6 m

h = 8m
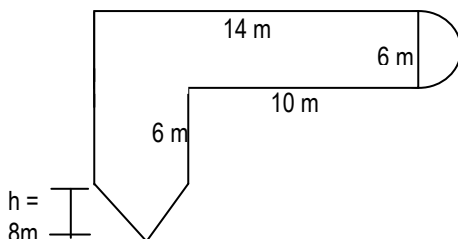
6.) Susan is re-finishing her kitchen floor. The dimensions of her kitchen floor are shown below:

24 feet

6 feet

(NOTE: The figure is not drawn to scale.)

4 feet

15 feet

6 feet
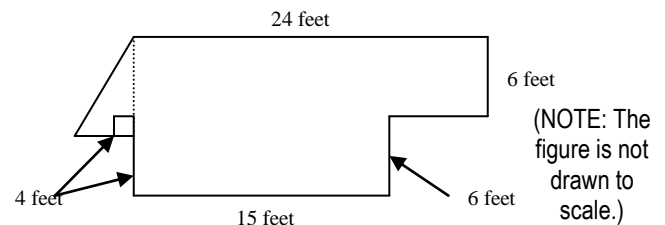
What is the area, in square feet, of Susan's kitchen floor?

a) 250 ft²   b) 266 ft²   c) 298 ft²   d) 302 ft²

Unit: Knowledge of Measurement   **Textbook Section: 11-2**

Objective: Estimate and determine the volume of a cylinder

Examples:

- **Amount a 3-D figure will hold**
- **Always cubed. For Example: cm3 or cubic centimeters**
- **FORMULA: Generalized: V = Bh where B = area of the base and h = height**

Volume of Cylinders: The volume V of a cylinder with radius r is the area of the base, πr^2, times the height h, or
$$V = \pi\, r^2 h$$
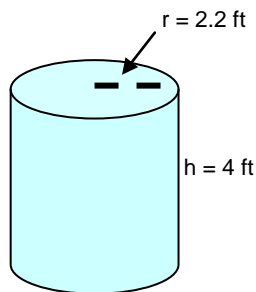
r = 2.2 ft

h = 4 ft

$V = \pi\, r^2\, h$
$V = 3.14 \cdot 2.2^2 \cdot 4$
$V = 3.14 \cdot 4.84 \cdot 4$
$V = 15.1976 \cdot 4$
$V = 60.7904 = 60.8\ ft^3$

*Note:
$2.2^2 = 2.2 \times 2.2 = 4.84$

d = 20 ft

h = 5 ft
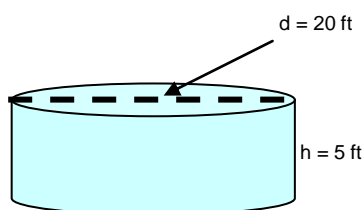
$V = \pi\, r^2\, h$
$V = 3.14 \cdot 10^2 \cdot 5$
$V = 3.14 \cdot 100 \cdot 5$
$V = 314 \cdot 5$
$V = 1570 = 1570\ ft^3$

*Note:
d = 20 THEREFORE r = 10
$10^2 = 10 \times 10 = 100$

You may use a calculator to solve # 1 – 6. Round to the nearest hundredth if necessary.

1.) Estimate the volume of this cylinder.

4 yd.

8 yd.
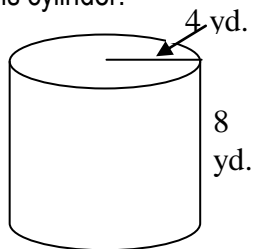
A) 384 yd.^{3} B) 790 yd.^{3} C) 401 yd.^{3} D) 785 yd.^{3}

2.) Determine the volume of this cylinder.

5 m

11 m
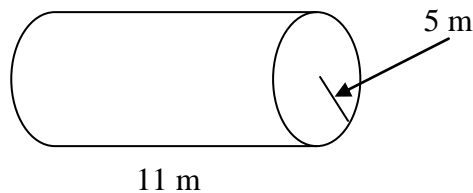
3.) Determine the volume of this cylinder.

12 mm

7 mm
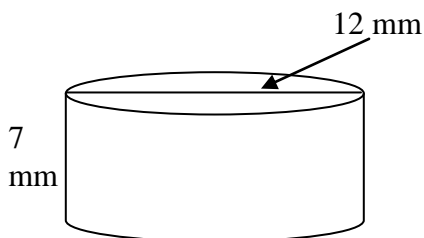
4.) Determine the volume of this cylinder.

18 cm

9 cm
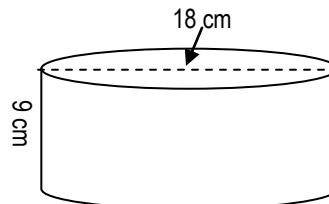
5.) A water tank is in the shape of a cylinder that has a height of 75 meters and a diameter of 20 meters. Determine the volume of this cylinder.

6.) Your Science teacher is teaching your class about Kaleidoscopes and how to build them. Your Kaleidoscope has a radius of 2 inches and a height of 9 in. What is the volume of your Kaleidoscope?
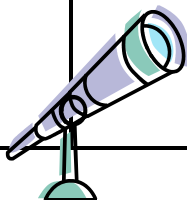
Unit: Knowledge of Measurement **Textbook Section: 6-2 & 6-3**

Objective: Use **proportions**, **scale drawings**, or rates to solve measurement problems - A

Examples:

- Scale drawings and scale models can show objects that may be very big, or very small, or very complex. Common examples of scale drawings and scale models are maps, architects' drawings, and models of homes and buildings.
- In all cases a numerical scale is used to compute the actual dimensions. A scale is a ratio – the ratio between the dimensions of the drawing and the actual dimensions of the object.
- Proportions are useful in solving a variety of problems. Be sure to set up the proportion according to the labels!

On a map, Andy measured the distance between Baltimore and Hagerstown. It is 9 cm. The scale on the map shows 4 cm = 30 miles. What is the approximate distance from Baltimore to Hagerstown?   **STRATEGY: Write a proportion and solve it.**

Step 1: Use the scale to set up a proportion.

$$\frac{CM}{MI} = \frac{4}{30} = \frac{9}{n}$$

Step 2: Solve the proportion by cross-multiplying.

$$4 \times n = 9 \times 30$$
$$4n = 270 \quad \text{(Divide both sides by 4)}$$
$$n = 67.5 \text{ miles}$$

SOLUTION: The approximate distance from Baltimore to Hagerstown is 68 miles.

Look at this scale drawing. How many meters long is the actual race car?   **STRATEGY: Set up a proportion and solve it.**

Step 1: Set up the scale as a ratio. $\dfrac{cm}{m} = \dfrac{1}{1.5}$ and for the car. $\dfrac{cm}{m} = \dfrac{5}{?\,m}$

Step 3: Set up the proportion & solve it for m.

$$\frac{1}{1.5} = \frac{5}{m}$$
$$1m = 5 \times 1.5$$
$$m = 7.5 \text{ meters}$$

5 cm

SCALE: 1 cm = 1.5 m

SOLUTION: The actual race car is 7.5 meters long.
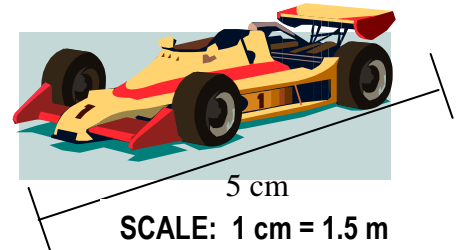
1.) Use proportions to solve.	**2.)** The distance on a map is 4.25 inches. The map scale is 1 inch = 6 miles. What is the actual distance?
$$\frac{6}{9} = \frac{n}{12}$$	$$\frac{inches}{miles} = \frac{1}{6} = \frac{4.25}{n}$$
3.) On an architectural drawing, the scale is 0.25 inch=5 feet. Determine the actual length of a room that has a drawing distance of 2 inches. $$\frac{inches}{feet} = \frac{0.25}{5} = \frac{2}{n}$$	**4.)** Solve the proportion: $$\frac{inches}{feet} = \frac{0.25}{2} = \frac{n}{48}$$
5.) A girl who is 4 feet tall casts a shadow of 3 feet. If a flagpole is 20 feet high, what is the length of the shadow of the flagpole?	**6.)** On a map, the key indicates that 1 cm = 3.5 meters. A road is shown on this map that runs for 30 cm. How long is this road?
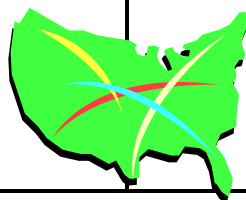
Unit: Knowledge of Measurement   **Textbook Section: 6-2 & 6-3**

Objective: Use **proportions**, scale drawings, or **rates** to solve measurement problems - B

Examples:

- A RATE is a fixed ratio between two quantities of different units, such as miles and hours, dollars and hours, points and games. If the second number of a rate is 1 then the rate is called a UNIT RATE. UNIT RATE examples: 60 miles per hour and $15 per hour

---

Last week Mike worked 30 hours and earned $240. What was his rate of pay?

STRATEGY: Divide the total earned by the number of hours.

Step 1: How much money did Mike earn? $240
Step 2: How many hours did he work?   30 hours
Step 3: Determine the rate of pay.

Divide the amount of money earned by the number of hours. $\dfrac{\text{amount of \$}}{\text{\# of hours worked}} = \dfrac{240}{30} = \$8 \text{ per hour}$

SOLUTION: Mike earned $8 per hour. (note: this is a unit rate)

The unit price of a can of tuna fish at the GHK Supermarket is $2.43. How much will 7 cans cost?

STRATEGY: Use the definition of unit price.
Step 1: Unit price means the price of one unit or the price of one can of tuna fish. $2.43
Step 2: Multiply.   2.43 x 7 = $17.01
SOLUTION: Seven cans of tuna fish cost $17.01
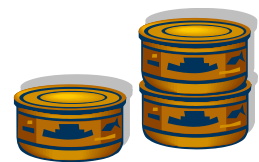
1.) If you travel 500 km in 20 hours, how many km do you travel per hour?	**2.)** A 2.6-kg bag of cherries for $4.84. How much per kg. _____ per kg
3.) There are 1962 calories for 6 servings of pie. How many calories per serving? _____ calories per serving	**4.)** An international phone call costs $8.72 for 27 minutes. How many cents per minute does an international phone call cost? _____ cents per minute
5.) You were hired for the summer to mow your neighbor's lawn. You earned a total of $372 and worked a total of 12 days. How much did you earn per day?	**6.)** Sheryl swims 5 laps in 15 minutes. At this same rate, how many laps will she swim in 30 minutes?
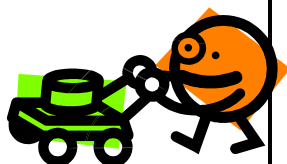
Unit: Knowledge of Statistics
Objective: Interpret circle graphs
Examples:
A Circle Graph is useful when you want to compare parts of a whole.

This circle graph shows the favorite pastimes of a group of 8th graders.
STRATEGY: Use the data in the circle graph.

Favorite Pastimes

Playing Computer Games 10%
Watching TV 15%
Other 5%
Reading 20%
Talking on the Phone 25%
Playing Sports 25%
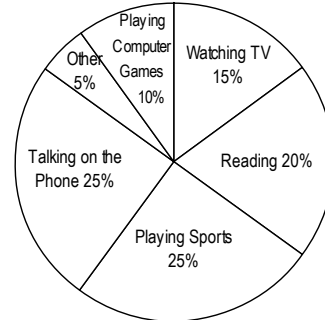
1.) Which two activities were equally popular?

Step 1: Look for activities with the same percent.   Playing Sports and Talking on the Phone are each 25%
SOLUTION: Playing Sports and Talking on the Phone were equally popular.

2.) What percent of students chose Reading or Watching TV?

Step 1: Determine the sum of the percents for Reading and Watching TV.   20% + 15% = 35%
SOLUTION: 35% of the students chose Reading or Watching TV.

3.) If 320 students were surveyed, how many would have chosen playing computer games?

Step 1: Determine the % for playing computer games. Change to a decimal.   10% = 0.10
Step 2: Multiply by the total.   320 x 0.10 = 32.0
SOLUTION: 32 students chose playing computer games as their favorite pastime.

Use the following circle graph to answer questions 1 – 6.

Michelle's Expenses Last Month

Bus Fare 25%
Snacks 40%
Phone Calls 10%
Video 25%
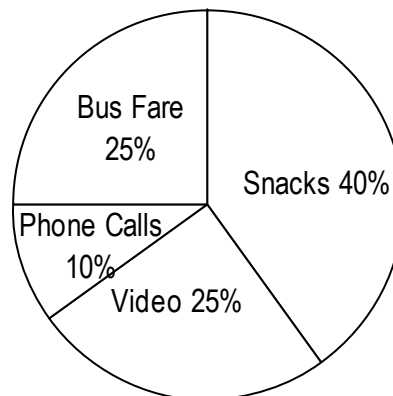
1.) What percent did Michelle spend on Snacks and Bus Fare?	**2.)** Which 3 expenses make up 90% of Michelle's budget?
3.) If Michelle received $80 last month for allowance, how much did she spend on Videos?	**4.)** How much would Michelle have spent on snacks and bus fare if her allowance was $125?
5.) How much more did Michelle spend on Video's than on phone calls if she received an allowance of $95?	**6.)** Michelle's allowance for the month was $100, however she did some extra work for her grandparents and earned $35 more dollars to add to her total allowance. Based on her total, how much would Michelle spend on Bus Fare and Phone calls?

Unit: Knowledge of Statistics   **Textbook Section: NONE**
Objective: Interpret tables
Examples:
- A table contains numerical information or data that is organized. The data is arranged in columns, each providing a specific type of information.
- You can use the data in a table to solve problems.

How many more computers are in Room 108 than in Room 215?

Computers in Computer Labs at Blake Middle School

Classroom	PC	Macintosh
104	18	8
108	12	6
207	5	11
215	8	7
302	4	9

STRATEGY: Add the numbers in the two different rows and subtract the sums.
Step 1: Determine the row for Room 108 & add the numbers   12 + 6 = 18
Step 2: Determine the row for Room 215 & add the numbers   8 + 7= 15
Step 3: Subtract the sum for Room 215 from the sum for Room 108.   18 – 15 = 3
SOLUTION: There are 3 more computers in Room 108.

Maryland State Parks

Park	# of Campsites	Area in Acres
Assateague Island	350	756
Janes Island	104	3,147
Martinak	63	107
Pocomoke River	223	94
Tuckahoe	51	3,498

Use the Maryland State Parks Table to your left to answer questions 1 & 2.

1.) How much larger is Janes Island State Park than Pocomoke River State Park?

2.) Which two Islands total more than 4,000 acres but less than 5,000 acres? What is their total combined acreage?

This table shows how much money five teams raised during a two-day car wash. Use the table to answer questions # 3 – 6.

CAR WASH FUND-RAISER

Team	Saturday	Sunday
Blue	$65	$35
Yellow	$45	$40
Red	$40	$35
Green	$25	$25
Purple	$55	$40

3.) Which team raised the largest amount of money?

4.) What was the total amount of money raised on Saturday?

5.) What fraction of the total amount collected on Sunday did the Red team collect?

6.) What percent, of the total amount collected on Saturday did the Purple team collect? Round your answer to the nearest tenth

Objective: Express the probability of an event as a fraction, a decimal, or a percent

Examples:

Probability is a way to measure the chance that an event will occur. You can use this to determine the probability, P, of an event.

P = number of favorable outcomes
Number of possible outcomes

Probability can be expressed as a FRACTION, DECIMAL, or PERCENT.

A jar contains 10 purple, 3 orange, and 12 blue marbles. A marble is drawn at random.
Determine the probability that you will pick a purple marble. Express your answer in a fraction, decimal, and %.

Step 1 – Determine the total # of marbles.   10 + 3 + 12 = 25
Step 2 – Determine the probability of picking a purple marble. P(purple) = **number of purple   =   10 ÷ 5 = 2**
                                                                                            Total marbles   25 ÷ 5 = 5

Step 3 – Simplify the fraction.
Step 4 – Convert Fraction to a Decimal – Divide.   **2 ÷ 5 = 0.4**
Step 5 – Convert Decimal to a % - Move decimal 2 places to the right. **0.4 = 40%**

For Questions # 1 – 6, Determine the probability for the following situation. Express your answer in Fraction, Decimal, and % forms.

A jar contains 15 orange, 14 white, 10 pink, 2 green, and 4 blue marbles. A marble is drawn at random.

1.) P (orange) =

2.) P (black) =
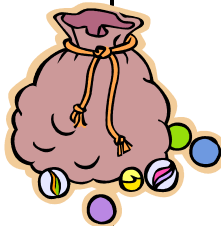
3.) P (not blue) =

4.) P (not pink) =

5.) P (all colors) =

6.) P (pink or orange) =

Unit: Knowledge of Probability	Textbook Section: 12-9

Objective: Describe the difference between independent and dependent events

Examples:

Probability is a way to measure the chance that an event will occur. You can use this to determine the probability, P, of an event.

$$P = \frac{\underline{\text{number of favorable outcomes}}}{\text{Number of possible outcomes}}$$

Two events are **INDEPENDENT** when the outcome of one event has no effect on the outcome of another event. For example:
- Event: tossing a coin and getting tails   OR   Event: tossing a number cube and getting a number less than 5

When determining the probability of two independent events, multiply the probabilities of the two events to get the total probability. This is called the multiplication rule.

Determine the probability of tossing a coin and getting tails and tossing a number cube and getting a number less than 5.

STRATEGY: Find the probability of each even and apply the multiplication rule.

Step 1: Determine the probability of each event.

Tossing the coin:

Probability of tails = $\frac{1}{2}$

Tossing the number cube:

Probability of a # < 5 = $\frac{4}{6} = \frac{2}{3}$

Step 2: Apply the multiplication rule:

$\frac{1}{2} x \frac{2}{3} = \frac{2}{6} = \frac{1}{3}$

SOLUTION: The probability is $\frac{1}{3}$.

Two events are **DEPENDENT** when the outcome of one event is affected by the outcome of the other. For Example: You draw a yellow marble out of a bag of marbles and do NOT replace the marble before drawing a second marble. If you started with 20 marbles, you no longer have 20 – you now have 19. This situation is DEPENDENT on what happened during the first draw.

1.) Describe the difference between Independent & Dependent Events. Give an example of each (Do not use the above examples.	**2.)** Tell whether each situation is INDEPENDENT or DEPENDENT. A) Picking a cookie from the cookie jar, eating it, then choosing another cookie. B) Toss a coin and spin a colored spinner C) Picking colored marble and then rolling a die
3.) You flip a coin and toss a 1-6 number cube. Determine the probability that you will roll anything but a 3 and will not get tails. P(not tails and not a 3) =	**4.)** Jack heard the weather forecast on TV: the probability of rain today is 20% and the probability of rain tomorrow is 50%. What is the probability that it will rain on both days?
5.) A bag contains 2 Snickers, 3 Milky Way, and 5 Heath snack bars. Bailey reaches in the bag and randomly takes two snack bars, one after the other. She wants to know the probability that she will choose a Snickers bar and then a Milky Way bar. **INDEPENDENT OR DEPENDENT**	**6.)** You roll a number cube numbered from 1 to 6. You then spin a spinner with 3 sections each with a different color. The spinner has the colors orange, gray, and pink. Determine the probability shown below: P(2, 4, 1, 5, or 3 and orange) =

| Unit: Knowledge of Probability | Textbook Section: 12-9 |

Objective: Determine the probability that a second event is dependent upon a first event of equally likely outcomes and express the probability as a fraction, decimal, or percent

Examples:

- **Remember:** Two events are DEPENDENT when the outcome of one event is affected by the outcome of the other.

A bag contains 3 green, 3 blue, and 3 yellow marbles. What is the probability of drawing a blue marble followed by a yellow marble in that order when you draw two marbles from the bag without returning the first marble to the bag?

STRATEGY: Use the multiplication rule.

Step 1: Determine the probability of getting blue as the first marble.   3 of 9 marbles are blue = $\dfrac{3}{9} = \dfrac{1}{3}$

Step 2: Determine the probability of getting yellow as the second marble.

   After the first selection, 8 marbles remain in the bag.   3 of the marbles are yellow = $\dfrac{3}{8}$

Step 3: Apply the multiplication rule. $\dfrac{1}{3} x \dfrac{3}{8} = \dfrac{3}{24} = \dfrac{1}{8}$

SOLUTION: The probability of getting blue and then yellow without returning the first marble to the bag is $\dfrac{1}{8}$.

You can express the probability as a fraction, decimal, or percent: $\dfrac{1}{8} = 1 \div 8 = 0.125 = 12.5\%$

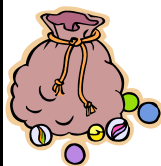|	
1.) A deck of cards has 3 blue, 4 black, and 6 purple cards. You pick 2 cards from the deck. Cards are <u>not</u> returned to the deck after they are picked. Express the probability as a simplified fraction. P(two blue cards in a row) =	**2.)** There are 6 red, 2 yellow, 6 black, and 5 blue marbles in a hat. You pick 2 marbles from the hat. Marbles are <u>not</u> returned after they have been drawn. Express the probability as a %. Round to the nearest tenth. P(the first marble is red and the second marble is black)
3.) Mike has 25 red tiles, 10 green tiles, and 15 blue tiles in a paper bag. If he chooses a tile at random, **does not return it to the bag**, and then chooses a second tile, what is the probability that the two tiles will be green and blue in that order? Express your answer in a decimal, rounded to the nearest hundredth.	**4.)** A standard deck of cards has 13 hearts, 13 diamonds, 13 clubs, and 13 spades. Juan picks one card from the deck and gets a heart and **does not replace** it in the deck of cards. Determine the probability that Juan will now pick a club from the deck. Express your answer as a fraction.
5.) A bag contains 3 green, 3 blue, and 3 yellow marbles. You reach into the bag and pull out a blue marble and do not replace it. Determine the probability that you will now pick out a yellow marble. Express your answer as a decimal.	**6.)** Jason has 4 quarters, 3 dimes, and 3 nickels in his pocket. Jason reaches into his pocket and pulls out a dime and does not replace it. Determine the probability that he will now pull out a nickel. Express your answer as a percent. Round your answer to the nearest tenth of a percent

Unit: Knowledge of Number Relationships and Computation   **Textbook Section: 9-1**
Objective: Estimate the square roots of whole numbers
Examples:

- **A Perfect Square is the square of a whole number.**

- **A square root of a number is one of two equal factors of the number.**

- **Every positive number has a positive square root and a negative square root.**

- **The square root of a negative number such as -25, is not real because the square of a number is never negative.**

A.) $\sqrt{144}$ **Since 12² = 144, then $\sqrt{144}$ = 12**

B.) - $\sqrt{49}$ **Since 7² = 49, then $\sqrt{49}$ = -7**

C.) ± $\sqrt{4}$ **Since 2² = 4, then ± $\sqrt{4}$ = ± 2**

D.) $\sqrt{34}$ **Determine a perfect square closest to 34.**
   5x5 = 25   34   6x6 = 36 ← this is closest to 34
So we know that the answer is going to be less than
   6 but not by much.   Estimate: 5.8
   Use a calculator to check…round to the nearest tenth
   5.830951895 ≈ 5.8

1.) Determine the square root: $-\sqrt{100}$

2.) Estimate the square root: $\sqrt{47}$
(Round to the nearest tenth)
Check your estimate with a calculator.

3.) Determine the square root: $\pm\sqrt{81}$

4.) Estimate the square root: $-\sqrt{310}$
(Round to the nearest tenth)
Check your estimate with a calculator.

5.) A square tarpaulin covering a softball field has an area of 121 m². What is the length of one side of the tarpaulin?

(Hint: Determine the square root of 121)

6.) If x^2 = 76, estimate the value of x to the nearest whole number? Do not use a calculator.

Unit: Knowledge of Number Relationships and Computation   **Textbook Section: 6-2, 6-3, 6-5**
Objective: Solve problems using proportional reasoning
Examples:
- Proportions are useful in solving a variety of problems.
- Be sure to set up the proportion according to the labels! Use this to help you set up the proportion.
- In a **PERCENT PROPORTION**, one of the numbers, called the **PART** is being compared to the whole quantity called the **BASE**. The other ratio is the %, written as a fraction, whose base is 100.

PERCENT PROPORTION: $\dfrac{\%}{100} = \dfrac{part}{whole}$

A) Twelve is what % of 16?

Part	12		%
Whole	16	=	100

Cross multiply $12 \times 100 = 16 \times n\%$
Divide to get n $\dfrac{1200}{16} = \dfrac{16n}{16}$
   By itself

                    $75 = n$
So 12 is 75% of 16.

B) What # is 1.4% of 15?

Part	n		1.4
Whole	15	=	100

              $n \times 100 = 15 \times 1.4$
              $\dfrac{100n}{100} = \dfrac{21}{100}$

                  $n = 0.21$

C) 225 is 36% of what #?

Part	225	36
Whole	n	100
	=	

         $n \times 36 = 225 \times 100$
         $\dfrac{36n}{36} = \dfrac{22500}{36}$

             $n = 625$

D) If 6 out of 8 students wore shorts to school, how many students are in the school if there were 630 students wearing shorts?

Part	6	630
Whole	8	n

           $8 \times 630 = 6 n$
           $\dfrac{5040}{6} = \dfrac{6 n}{6}$

             $n = 840$ students

1.) Use proportions to solve.	**2.)** Use proportions to solve.
What percent of 60 is 15?	75 is 20% of what number?
3.) If 5 out of 10 people prefer Trident gum. How many people out of 20 would you expect to like Trident?	**4.)** 300 students were surveyed. 50 of them liked pepperoni pizza the best. How many students would you expect to like pepperoni pizza if you asked 600 students?
5.) 20% of the M&M's in your bag are the color blue. If there are 50 M&M's total, how many are blue?	**6.)** You earned 20 points on a test out of 50. What was your percent on the test?

Sunsational Websites

Here are some fun and exciting websites to visit over

the summer for practice.

At the time this was created, the websites listed were checked by teachers and deemed child appropriate. However, parents should always monitor their child's use of any Internet site.

http://www.mathisfun.com/

http://www.weeklyreader.com/kids/games/sudoku.asp

http://www.funbrain.com/

http://www.aplusmath.com/Games/index.html

http://www.kidsnumbers.com/games.pp

www.mathforum.org

www.aaamath.com

Fun Summer Math Books

Math Made Fun by Lisa Palmer

Sideways Arithmetic from Wayside School by Louis Sachar

A Grain of Rice by Helena Clare Pittman

Counting on Frank by Rod Clement