

**Summer Packet**  
**for Students Entering**  
**8<sup>th</sup> Grade Math**  
**Fall 2018**

*Pomfret Community School*

*Ms. Slingo*

Name: \_\_\_\_\_

**Directions:**

To retain your mathematical awesomeness, work on this packet **throughout** the summer! Do not rush to complete it in June or wait until the third week of August. **Spread it out throughout the summer!** You should plan to complete a little more than one page per week.

Completion of this packet counts as your first 8<sup>th</sup> Grade Math assignment.

As a bonus, you will get a homework pass for turning in a complete packet.

Packets are due on the 2<sup>nd</sup> day of school.

As always, show your work!

## Knowledge of Algebra, Patterns, and Functions

**Objective:** Complete a function table with a given two operation rule.

The solution of an equation with two variables consists of two numbers, one for each variable, that make the equation true. The solution is usually written as an ordered pair.

Complete the following tables:

1.)

$$C = 3H + 4$$

H	$3H + 4$	C
2	$3(2) + 4$	10
4	$3(4) + 4$	16
6		
10		

2.)

$$Y = 5X + 2$$

X	$5X + 2$	Y
3		
6		
9		
12		

3.)

$$Y = 5X - 3$$

X	$5X - 3$	Y
1	$5(1) - 3$	2
2		
3		
4		

4.)

$$A = 4B - 3$$

B	$4B - 3$	A
3		
4		
5		
6		

**Objective:** Write an algebraic expression to represent unknown quantities with one unknown and 1 or 2 operations.

Write each phrase as an algebraic expression.

1.) 7 less than  $m$

$$m - 7$$

2.) The quotient of 3 and  $y$

3.) 7 years younger than Jessica

4.) 3 times as many marbles as Bob has

5.) Let  $t$  = the number of tomatoes Tye planted last year. This year she planted 3 times as many. Write an algebraic expression to show how many tomatoes Tye planted this year.

**Objective:** Evaluate an algebraic expression .

Evaluate the following expressions using the given values for a, b, and c. Show each step!

1.) Evaluate  $6 + 3b$  if  $b = 7$

2.) Evaluate  $6a^2$  if  $a = 4$

3.) Evaluate  $5(6) - c$  if  $c = 7$

**Objective:** Evaluate numeric expressions using order of operations.

Evaluate each of the following. Show each step!

1.)  $(2 + 10)^2 \div 4$

2.)  $(6 + 5) \cdot (8 - 6)$

3.)  $72 \div 3 - 5(2.8) + 9$

4.)  $3 \cdot 14(10 - 8) - 60$

**Objective:** Write equations and inequalities

Write an equation for each of the following:

1.) 4 less than 3 times a number is 14.

2.) There are 5 people in Johnny's rock band. They made  $x$  dollars playing at a dance hall. After dividing the money 5 ways, each person got \$67.



**Objective:** Determine the unknown in a linear equation with 1 or 2 operations

Solve  $x - 9 = -12$

Solve  $48 = -6r$

Solve  $2t + 7 = -1$

5.) It costs \$12 to attend a golf clinic with a local pro. Buckets of balls for practice during the clinic cost \$3 each. How many buckets can you buy at the clinic if you have \$30 to spend?

**Objective:** Solve for the unknown in an inequality with one variable.

1.) Solve  $y + 5 \leq 14$

2.) Solve  $6u \geq 36$

3.) Solve  $5y + 1 < 36$

4.) Solve  $4x - 6 > -10$

**Objective:** Write equations and inequalities

Write an inequality for each of the following:

1.) Five times a number is greater than 25.

2.) The sum of a number and 6 is at least 15.

3.) 24 divided by some number is less than 7.

4.) Five dollars less than two times Chris' pay is at most \$124.

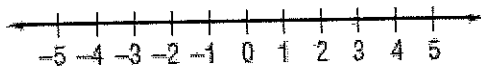
**Objective:** Identify or graph solutions of inequalities on a number line.

1.) Write an inequality for the graph.



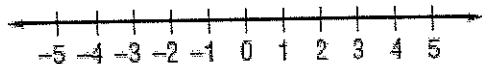
2.) Graph the inequality.

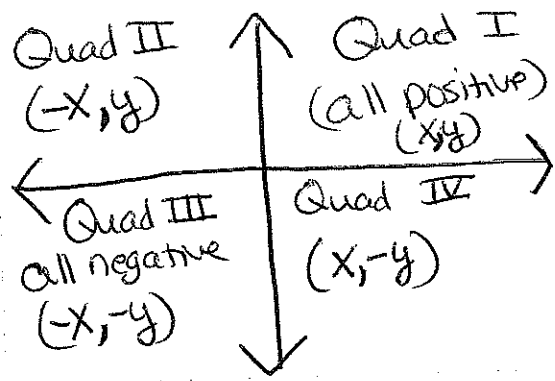
$$b \geq -1$$



3.) Solve the inequality, then graph it on the number line.

$$y + 9 \leq 13$$





**Objective:** Graph ordered pairs in a coordinate plane.

1.) Name the ordered pair for each point graphed at the right. Then identify the quadrant in which each point lies.

Coordinates	Quadrant
P (   ,   )	
Q (   ,   )	
R (   ,   )	
S (   ,   )	

3.) Graph and label each point on the coordinate plane.

N (3, -1)
P (-2, 4)
Q (-3, -4)
R (0, 0)
S (-5, 0)

**Objective:** Identify and describe the change represented in a table of values; identify increase, decrease, or no change.

**Example:** Look at the table below. How are Wages (y) affected by the number of Hours Worked (x)?

Hours Worked (x)	Wages (y)
2	\$14
4	\$28
6	\$42
8	\$56

Identify the change as **increasing**, **decreasing**, or **no change**. Describe the changes in y-values.

*As the Hours Worked (x) increase, the wages (y) increase. Wages increase by \$14 dollars for every 2 hours worked (or \$7 for every hour worked).*

Identify the change in each table of values as **increasing**, **decreasing**, or **no change**. Describe the changes in y-values.

1.)

Homework Minutes (x)	Test Grades (y)
25	61
35	74
45	87
55	100

2.)

Time Hours (x)	Distance Miles (y)
1	50
2	100
3	150
4	200

3.)

Temperature (x)	Dewpoint (y)
68°	1.9°
76°	1.3°
91°	0.7°
104°	0.1°

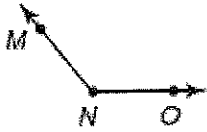
4.)

Cell Phone Plan Minutes (x)	Cost (y)
625	\$59.99
723	\$59.99
829	\$59.99
899	\$59.99

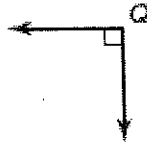
## Knowledge of Geometry

**Objective:** Identify and describe angles formed by intersecting lines, rays, or line segments

1.) Classify the angle as **acute**, **obtuse**, **right**, or **straight**.

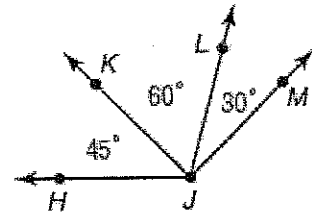


2.) Classify the angle as **acute**, **obtuse**, **right**, or **straight**.



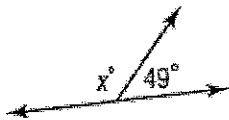
3.)

Name all of the acute angles.

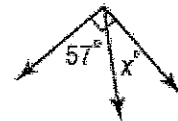


**Objective:** Determine the measure of angles formed by intersecting lines, line segments, and rays.

1.) Find the value of  $x$ .

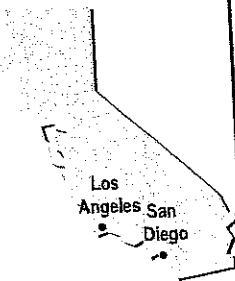


2.) Find the value of  $x$ .



**Objective:** Determine the distance between 2 points using a drawing and a scale.

1.) On a map, the distance from Los Angeles to San Diego is 6.35 cm. The scale is 1 cm = 20 miles. What is the actual distance?



2.) Lexie is making a model of the Empire State Building. The scale of the model is 1 inch = 9 feet. The needle at the top is 31.5 feet tall. How big should the needle be on the model?





## Knowledge of Statistics

**Objective:** Compare the measures of central tendency (mean, median, mode) to determine which is most appropriate.

For each set of data (Miles of Shoreline and Book Sales), answer the following questions:

- Determine the mean, median, and mode of the data.
- Which measure of central tendency is misleading in describing the data? Explain.
- Which measure of central tendency most accurately describes the data? Explain.

Remember:

Mean (Average) - add all numbers and then divide the sum by the number of numbers.

Median - the center of the data

mode - the data point that occurs most often

- Book Sales: Use the table below that shows the number of books sold each day for 20 days.

Book Sales Per Day			
23	18	23	15
24	16	0	11
19	10	13	17
12	23	11	16
36	24	12	27

- Michael & Melissa both claim to be earning a C average, 70% to 79%, in their Latin Class. Use the table below to explain their reasoning and determine which student is earning a C average.

GRADES (%)							
	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7
Michael	80	76	73	70	40	25	10
Melissa	88	83	75	70	60	65	62

## Knowledge of Number Relationships & Operations

**Objective:** Read, write, and represent whole numbers using exponential notation.

1.) Write  $15^4$  as a product of the same factor.

$$15 \cdot 15 \cdot 15 \cdot 15$$

2.) Write  $2^7$  as a product of the same factor.

3.) Evaluate  $7^3$ .

$$7 \cdot 7 \cdot 7 = 343$$

4.) Evaluate  $8^4$ .

5.) Write  $9 \cdot 9 \cdot 9 \cdot 9 \cdot 9$  in exponential form.

$$9^5$$

6.) Write  $12 \cdot 12 \cdot 12$  in exponential form.

7.) Write 1,000,000 as a power of 10.

$$10^6$$

8.) Evaluate  $10^9$ .

**Objective:** Determine equivalent forms of rational numbers expressed as **fractions, decimals, percents, and ratios.**

1.) Write 0.735353535... using bar notation to represent the repeating decimal.

2.) Write  $\frac{3}{5}$  as a decimal.

3.) Write  $4\frac{5}{8}$  as a decimal.

4.) Write 0.94 as a fraction in simplest form.

5.) Write 0.48 as a fraction in simplest form.

6.) There were 6 girls and 18 boys in Mrs. Johnson's math class. Write a ratio of the # of girls to the # of boys in fraction form. Then write the fraction as a repeating decimal.

**Objective:** Determine equivalent forms of rational numbers expressed as **fractions, decimals, percents, and ratios.**

1.) Write  $\frac{7}{25}$  as a percent and decimal.

2.) Write 19% as a decimal and fraction in simplest form.

**Objective:** Compare, order, and describe rational numbers.

1.) Order from least to greatest.

$$22\%, 0.3, \frac{1}{5}$$

2.) Order from least to greatest.

$$0.74, \frac{3}{4}, 70\%$$

3.) Replace  $\bigcirc$  with  $<$ ,  $>$ , or  $=$ .

$$\frac{7}{12} \bigcirc 58\%$$

4.) Which is the largest?

$$1\frac{3}{8} \quad 1\frac{3}{10} \quad 1\frac{4}{9}$$

**Objective:** Add, subtract, multiply and divide integers.

1.)  $2 + (-7)$

2.)  $-13 - 8$

3.) Evaluate  $a - b$  if  $a = -2$  and  $b = -7$

4.) Evaluate  $x + y + z$  if  $x = 3$ ,  $y = -5$ , and  $z = -2$

5.) In Mongolia the temperature can dip down to  $-45^\circ\text{C}$  in January. The temperature in July may reach  $40^\circ\text{C}$ . What is the temperature range in Mongolia?

6.) Write an addition expression to describe skateboarding situation. Then determine the sum.

Hank starts at the bottom of a half pipe 6 feet below street level. He rises 14 feet at the top of his kickturn.

7.)  $-14 - (-7)$

8.) Divide:  $350 \div (-25)$

**Objective: REVIEW** Addition, subtraction, and multiplication of positive fractions and mixed numbers.

1.)  $\frac{1}{3} + \frac{1}{9}$

2.)  $7\frac{4}{9} + 10\frac{2}{9}$

3.)  $1\frac{5}{9} + 4\frac{1}{6}$

4.)  $2\frac{1}{2} + 2\frac{2}{3}$

13.) $\frac{2}{3} \times \frac{4}{5} =$	14.) $\frac{7}{3} \times 4\frac{1}{2} =$
15.) $2\frac{1}{2} \times 2\frac{1}{3} =$	16.) $3 \times 5\frac{2}{9} =$

<b>Objective:</b> Calculate powers of integers and square roots of perfect square whole numbers. <i>Without a calculator!</i>	
1.) Evaluate: $13^2 =$	2.) Evaluate: $\sqrt{81} =$
3.) Evaluate: $(-7)^2 =$	4.) Evaluate: $-\sqrt{100} =$
5.) Evaluate: $-4^2 =$	6.) Evaluate: $\sqrt{36} =$

<b>Objective:</b> Determine equivalent ratios.	
<p>1.) Write the ratio as a fraction in simplest form. *Remember: ratios must have the SAME measurement.</p> <p style="text-align: center;">12 feet : 10 yards</p>	<p>2.) Determine whether the pair of ratios is equivalent and forms a proportion.</p> $\frac{6}{14} \stackrel{?}{=} \frac{9}{21}$
<p>3.) Determine whether the ratios are equivalent. Explain.</p> <p style="text-align: center;">12:17 and 10:15</p>	<p>4.) Determine whether the pair of ratios is equivalent and forms a proportion.</p> $\frac{\$2.48}{4 \text{ oz}} \stackrel{?}{=} \frac{\$3.72}{6 \text{ oz}}$

**Objective:** Determine or use ratios, unit rates, and percents in the context of the problem.

1.) It is recommended that for every 8 square feet of surface, a pond should have 2 fish. A pond that has a surface of 72 square feet should contain how many fish?

$$\frac{2 \text{ fish}}{8 \text{ ft}^2} = \frac{? \text{ fish}}{72 \text{ ft}^2}$$

\_\_\_\_\_ fish

2.) An 8-ounce glass of Orange juice contains 72 milligrams of vitamin C. How much juice contains 36 milligrams of vitamin C?

3.) 9 is what percent of 30?

$$\frac{\text{part}}{\text{whole}} = \frac{\text{Percent}}{100}$$

**Objective:** Determine rate of increase and decrease, discounts, simple interest, commission, sales tax.

1.) Determine the percent of change. Round to the nearest whole percent if necessary. State whether the percent of change is an INCREASE or DECREASE.

Original: 250  
New: 100

2.) Determine the sale price to the nearest cent.

\$39.00 jeans  
40% off

**Objective:** Determine or use ratios, unit rates, and percents in the context of the problem.

1.) You earned 20 points on a test out of 50. What was your percent on the test?

2.) Chad purchased 6 Fierce Grape Gatorades for \$12.00. If Chad wanted to go back and buy one Tropical Punch Gatorade at the same price, how much would it cost?