

# Due the first day of school!

**Dear 8<sup>th</sup> Graders,**

We are so excited to have you on your last year at GPBXM. Please bring this packet completed by the first day of school. It will be graded for accuracy on effort. Why do you get summer homework? Well, if you go a while without studying or reviewing, you forget important information. We want to make sure you are successful during your last year and that begins with how much you already know, remember, and are fluent with.

We can't wait to see you!

GPBXM Math team

PS -- If you need extra resources, you should absolutely go to Khan Academy and IXL. If you lose the packet, copies can be found online and the main office will also have some.

# Summer Math Practice

## Students Entering 8<sup>th</sup> Grade

### 8<sup>th</sup> Grade- Summer Math Packet- Week 1

**Topic: Knowledge of Algebra, Patterns, and Functions**

**Examples:**

The tables below show phrases written as mathematical expressions.

Phrases	Expression
9 more than a number The sum of 9 and a number A number plus 9 A number increased by 9 The total of x and 9	$x + 9$
Phrases	Expression
6 multiplied by g 6 times a number The product of g and 6	$6g$

Phrases	Expression
4 subtracted from a number A number minus 4 4 less than a number A number decreased by 4 The difference of h and 4	$h - 4$
Phrases	Expression
A number divided by 5 The quotient of t and 5 Divide a number by 5	$\frac{t}{5}$

Write each phrase as an algebraic expression.

1.) 7 less than m	2.) The quotient of 3 and y
3.) 7 years younger than Mya	4.) 3 times as many marbles as Kayla has
5.) Let t = the number of tomatoes Jasmine planted last year. This year she planted 3 times as many. Write an algebraic expression to show how many tomatoes Jasmine planted this year.	6.) Last week Debbie sold x number of milkshakes at the city fair. This week she sold twice as many as last week, and then she sold 20 more. Write an expression to show how many milkshakes Debbie sold this week.

**8<sup>th</sup> Grade- Summer Math Packet- Week 2****Topic: Knowledge of Algebra, Patterns, and Functions****Example 1:** Evaluate  $6x - 7$  if  $x = 8$ .

$$\begin{aligned} 6x - 7 &= 6(8) - 7 && \text{Replace } x \text{ with } 8. \\ &= 48 - 7 && \text{Use order of operations.} \\ &= 41 && \text{Subtract 7 from 48.} \end{aligned}$$

**Example 2:** Evaluate  $5m - 15$  if  $m = 6$ .

$$\begin{aligned} 5m - 15 &= 5(6) - 15 && \text{Replace } m \text{ with } 6. \\ &= 30 - 15 && \text{Use order of operations.} \\ &= 15 && \text{Subtract 15 from 30.} \end{aligned}$$

**Example 3:** Evaluate  $\frac{7b}{3}$  if  $b = 6$ .

$$\begin{aligned} \frac{7b}{3} &= \frac{(7)(6)}{3} && \text{Replace } b \text{ with } 6. \\ &= \frac{42}{3} && \text{Multiply 6 by 7.} \\ &= 14 && \text{Divide.} \end{aligned}$$

**Example 4:** Evaluate  $x^3 + 4$  if  $x = 3$ .

$$\begin{aligned} x^3 + 4 &= 3^3 + 4 && \text{Replace } x \text{ with } 3. \\ &= 27 + 4 && \text{Use order of operations.} \\ &= 31 && \text{Add 27 and 4.} \end{aligned}$$

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  $c = 7$ 4.) Evaluate  $\frac{b^4}{4}$  if  $b = 2$ 5.) Evaluate  $\frac{7.5m}{5}$  if  $m = 2$ 6.) Evaluate  $\frac{(n)^2}{3}$  if  $n = 9$

8<sup>th</sup> Grade- Summer Math Packet- Week 3

## Topic: Knowledge of Algebra, Patterns, and Functions

**Use the order of operations to evaluate numerical expressions.**

1. Do all operations within grouping symbols first.
2. Evaluate all powers before other operations.
3. Multiply and divide in order from left to right.
4. Add and subtract in order from left to right.

**Example 1: Evaluate**  $14 + 3(7 - 2) - 2 \cdot 5$

$$\begin{aligned}
 &14 + 3(7 - 2) - 2 \cdot 5 \\
 &= 14 + 3(5) - 2 \cdot 5 && \text{Subtract first since } 7 - 2 \text{ is in parentheses} \\
 &= 14 + 15 - 2 \cdot 5 && \text{Multiply left to right, } 3 \cdot 5 = 15 \\
 &= 14 + 15 - 10 && \text{Multiply left to right, } 2 \cdot 5 = 10 \\
 &= 29 - 10 && \text{Add left to right, } 14 + 15 = 29 \\
 &= 19 && \text{Subtract 10 from 29}
 \end{aligned}$$

**Example 2: Evaluate**  $8 + (1 + 5)^2 \div 4$

$$\begin{aligned}
 &8 + (1 + 5)^2 \div 4 \\
 &= 8 + (6)^2 \div 4 && \text{Add first since } 1 + 5 \text{ is in parentheses} \\
 &= 8 + 36 \div 4 && \text{Find the value of } 6^2 \\
 &= 8 + 9 && \text{Divide 36 by 4} \\
 &= 17 && \text{Add 8 and 9}
 \end{aligned}$$

Evaluate each of the following. Show each step!

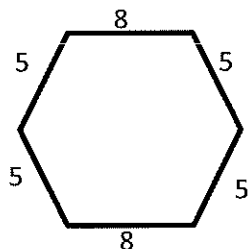
1.)  $(2 + 10)^2 \div 4$

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

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

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

5.) The perimeter of a hexagon is found by adding the lengths of all six sides of the hexagon. For the hexagon below write a number expression to find the perimeter. Then evaluate the expression.



6.) Without parentheses, the expression  $8 + 30 \div 2 + 4$  equals 27. Place parentheses in the expression so that it equals 13; then 23.

Use an integer strategy to find each answer.

$9 - 6 =$

$(-5) + 7 =$

$(-9) + (-2) =$

$7 - (-2) =$

$(-2) + 2 =$

$(-8) - 1 =$

$5 - (-1) =$

$2 + 1 =$

$7 + 1 =$

$15 \div 3 =$

$8 \div (-4) =$

$(-4) - 4 =$

$9 \times (-8) =$

$25 \div (-5) =$

$1 + 7 =$

$4 \div 2 =$

$(-6) \times (-1) =$

$5 \times 6 =$

$16 \div 2 =$

$5 + 5 =$

$(-5) \times (-2) =$

### 8<sup>th</sup> Grade- Summer Math Packet- Week 8

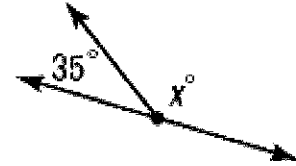
Topic: Knowledge of Algebra, Patterns, and Functions

**Example 1:** Find the value of  $x$  in the figure.

The two angles are supplementary, so the sum of their measures is  $180^\circ$ .

$$\begin{array}{r} x + 35 = 180 \\ - 35 \quad - 35 \\ \hline x = 145 \end{array}$$

**Write the equation**  
**Subtract 35 from both sides**  
**Simplify**  
**The angle is  $145^\circ$**

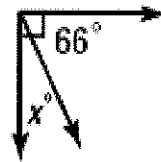


**Example 2:** Find the value of  $x$  in the figure.

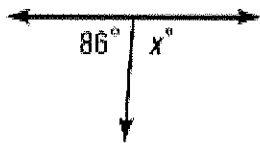
The two angles are complementary, so the sum of their measures is  $90^\circ$ .

$$\begin{array}{r} x + 66 = 90 \\ - 66 \quad - 66 \\ \hline x = 24 \end{array}$$

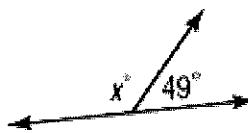
**Write the equation**  
**Subtract 66 from both sides**  
**Simplify**  
**The angle is  $24^\circ$**



1.) Find the value of  $x$ .



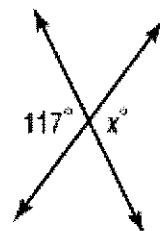
2.) Find the value of  $x$ .



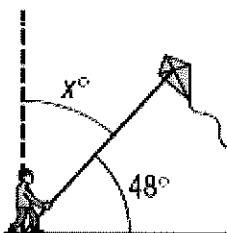
3.) Find the value of  $x$ .



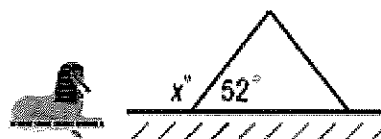
4.) Find the value of  $x$ .



5.) A kite string makes an angle of 48 degrees with respect to the ground as shown below. The dashed line is vertical and the ground is horizontal. How are the 48 degree angle and the unknown angle related? What is the value of  $x$ ?



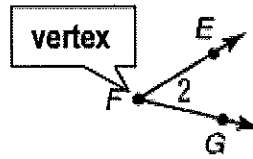
6.) A side view of the Great Pyramid at Giza is shown below. The sides of the pyramid make an angle of 52 degrees with respect to the ground. What is the value of  $x$ ?




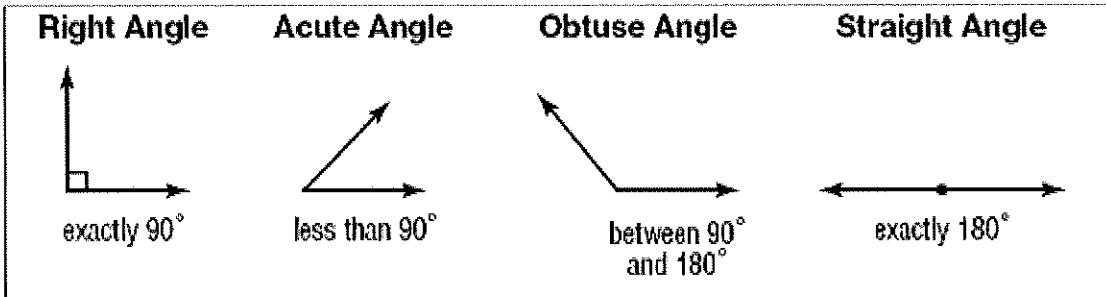
## 8<sup>th</sup> Grade- Summer Math Packet- Week 7

### Topic: Knowledge of Algebra, Patterns, and Functions

An **angle** is formed by two rays with a common vertex.  
 Angles are also formed by intersecting lines or line segments.  
 Angles are measured in **degrees**.  
 Angles are classified according to their measures.



$\angle 2$  (also called  $\angle EFG$ )  
  
 is formed by rays FE and FG



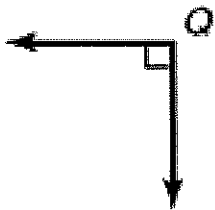
1.) Classify the angles as acute, obtuse, right, or straight.



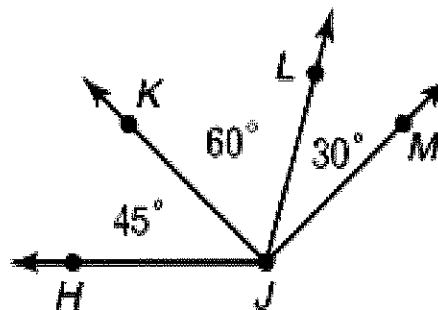
2.) Classify the angles as acute, obtuse, right, or straight.



3.) Classify the angles as acute, obtuse, right, or straight.



4.) Name all of the acute angles.



## 8<sup>th</sup> Grade- Summer Math Packet- Week 6

**Topic: Knowledge of Algebra, Patterns, and Functions**

**Example 1:**

The perimeter of a rectangle is twice the length (L) plus twice the width (W).  $P = 2L + 2W$   
Use the given formula to find the perimeter of the rectangle.



8 cm

10 cm

$$P = 2L + 2W$$

$$P = 2(10) + 2(8)$$

$$P = 20 + 16$$

$$P = 36 \text{ cm}$$

Write the equation

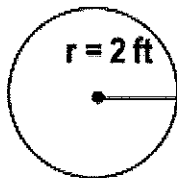
Replace L and W with the length and width

Multiply

Simplify and add the correct label

**Example 2:**

The area A of a circle equals the product of pi ( $\pi$ ) and the square of its radius (r).  $A = \pi r^2$  ( $\pi \approx 3.14$ )  
Use the given formula to find the area of the circle.



r = 2 ft

$$A = \pi r^2$$

$$A = 3.14 \cdot (2)^2$$

$$A = 3.14 \cdot 4$$

$$A = 12.56 \text{ ft}^2$$

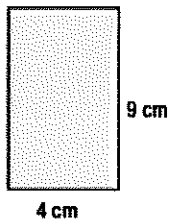
Write the equation

Replace  $\pi$  with 3.14 and r with 2

Square the 2

Simplify and add the correct label

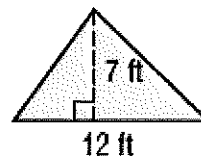
1.) The formula for finding the area of a rectangle is  $A = L \cdot W$ . Use this formula to find the area of the rectangle.



9 cm

4 cm

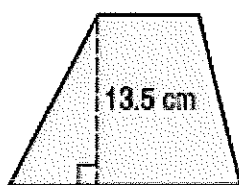
2.) The formula for finding the area of a triangle is  $A = \frac{1}{2}bh$ . Find the area of the triangle below.



12 ft

3.) A trapezoid has two bases ( $b_1$  and  $b_2$ ). The formula for finding the area of a trapezoid is:  $A = \frac{1}{2}h(b_1 + b_2)$

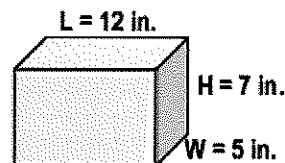
$b_1 = 8 \text{ cm}$



$b_2 = 18 \text{ cm}$

Find the area of the trapezoid.

4.) The formula for finding the volume of a rectangular prism is  $V = L \cdot W \cdot H$ . Find the volume of the box.



L = 12 in.

H = 7 in.

W = 5 in.



8<sup>th</sup> Grade- Summer Math Packet- Week 5

## Topic: Knowledge of Algebra, Patterns, and Functions

An **inequality** is a mathematical sentence that contains the symbols  $<$ ,  $>$ ,  $\leq$ , or  $\geq$ .

Words	Symbols
$m$ is greater than 7.	$m > 7$
$r$ is less than $-4$ .	$r < -4$
$t$ is greater than or equal to 6.	$t \geq 6$
$y$ is less than or equal to 1.	$y \leq 1$

**Example 2:** Solve  $2x + 8 < 24$

$$\begin{array}{r} 2x + 8 < 24 \quad \text{Write the inequality} \\ -8 \quad -8 \quad \text{Subtract 8 from each side} \\ \hline 2x < 16 \quad \text{Simplify} \\ \frac{2x}{2} < \frac{16}{2} \quad \text{Divide each side by 2} \\ x < 8 \quad \text{Simplify} \end{array}$$

**Example 1:** Solve  $v + 3 < 5$

$$\begin{array}{r} v + 3 < 5 \quad \text{Write the inequality} \\ -3 \quad -3 \quad \text{Subtract 3 from each side} \\ \hline v < 2 \quad \text{Simplify} \end{array}$$

**Check:** Try 1, a number less than 2

$$\begin{array}{r} v + 3 < 5 \quad \text{Write the inequality} \\ 1 + 3 < 5 \quad \text{Replace } v \text{ with 1} \\ 4 < 5? \quad \text{Is this sentence true? yes} \end{array}$$

**Check:** Try 7, a number less than 8

$$\begin{array}{r} 2x + 8 < 24 \quad \text{Write the inequality} \\ 2(7) + 8 < 24 \quad \text{Replace } x \text{ with 7} \\ 14 + 8 < 24 \quad \text{Multiply 7 by 2} \\ 22 < 24? \quad \text{Is the sentence true? yes} \end{array}$$

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

2.) Solve.  $6u \geq 36$

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

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

5.) The speed limit on highways in Florida is 70 miles per hour. Write and solve an inequality to find how long it will take you to travel the 105 miles from Orlando to St. Augustine if you travel at or below the speed limit.

6.) You have \$80. Jeans cost \$29 and shirts cost \$12. Mom told you to buy one pair of jeans and use the rest of the money to buy shirts. Use this information to write and solve an inequality. How many shirts can you buy?

## 8<sup>th</sup> Grade- Summer Math Packet- Week 4

### Topic: Knowledge of Algebra, Patterns, and Functions

Remember, equations must always remain balanced.

- If you add or subtract the same number from each side of an equation, the two sides remain equal.
- If you multiply or divide the same number from each side of an equation, the two sides remain equal.

**Example 1: Solve  $x + 5 = 11$**

$$\begin{array}{r} x + 5 = 11 \quad \text{Write the equation} \\ - 5 = - 5 \quad \text{Subtract 5 from both sides} \\ \hline x = 6 \quad \text{Simplify} \end{array}$$



$$\begin{array}{r} x + 5 = 11 \quad \text{Write the equation} \\ 6 + 5 = 11 \quad \text{Replace x with 6} \\ 11 = 11 \checkmark \quad \text{The sentence is true} \end{array}$$

**Example 2: Solve  $- 21 = - 3y$**

$$\begin{array}{r} - 21 = - 3y \quad \text{Write the equation} \\ - 3 = - 3 \quad \text{Divide each side by } - 3 \\ \hline 7 = y \quad \text{Simplify} \end{array}$$



$$\begin{array}{r} - 21 = - 3y \quad \text{Write the equation} \\ - 21 = - 3(7) \quad \text{Replace the y with 7} \\ - 21 = - 21? \quad \text{Multiply } - \text{ is the sentence true?} \end{array}$$

**Example 3: Solve  $3x + 2 = 23$**

$$\begin{array}{r} 3x + 2 = 23 \quad \text{Write the equation} \\ - 2 = - 2 \quad \text{Subtract 2 from each side} \\ \hline 3x = 21 \quad \text{Simplify} \\ \frac{3x}{3} = \frac{21}{3} \quad \text{Divide each side by 3} \\ x = 7 \quad \text{Simplify} \end{array}$$



$$\begin{array}{r} 3x + 2 = 23 \quad \text{Write the equation} \\ 3(7) + 2 = 23? \quad \text{Replace x with 7} \\ 21 + 2 = 23? \quad \text{Multiply} \\ 23 = 23? \quad \text{Add } - \text{ is the sentence true?} \end{array}$$

1.) Solve.  $x - 9 = -12$

2.) Solve.  $48 = -6r$

3.) Solve.  $2t + 7 = -1$

4.) Solve.  $4t + 3.5 = 12.5$

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?

6.) An online retailer charges \$6.99 plus \$0.55 per pound to ship electronics purchases. How many pounds is a DVD player for which the shipping charge is \$11.94?