

Name _____



Students entering 8th grade math Summer packet

Each week this summer please complete the following review sheets. Please show as much work as you can for each problem. This review sheets will be collected on Monday, September 9 and will be counted as a quiz grade for the first quarter. The pages will be graded for accuracy and completion. You may get help from your parents but do not use calculator. Doing this review will help you to prepare for the 8th grade math skills.

Have a great summer!

York Prep Math Department.

Summer Math Packet

Week 1

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS

Objective: Write an algebraic expression to represent unknown quantities.



- A **variable** is a symbol, usually a letter, used to represent a number.
- **Algebraic expressions** are combinations of variables, numbers, and at least one operation.

Examples:

The sum of 5 and some number is written as: $5 + n$ because the operation that is associated with the word **sum** is addition.

The difference of a number and three tenths is written as: $n - .3$ because the operation that is associated with the word **difference** is subtraction.

1.)

a number plus $\frac{1}{2}$

2.)

a number minus .7

3.)

the difference of twenty-one hundredths and a number

4.)

the sum of a number and forty-six

Summer Math Packet

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS

Objective: Evaluate an algebraic expression.

- A **variable** is a symbol, usually a letter, used to represent a number.
- **Algebraic expressions** are combinations of variables, numbers, and at least one operation.
- **Multiplication** in algebra can be shown as $4n$ or $4 \times n$
- The variables in an algebraic expression can be replaced with any number.
- Once the variables have been replaced, you can **evaluate**, or find the value of, the algebraic expression.

Examples:

Evaluate $44 + n$ if $n = 9$

$44 + n$	original expression
$44 + 9$	replace the variable with it's value
53	solution

1.)

Evaluate $150 + n$ if $n = 15$

2.)

Evaluate $12n$ if $n = 9$

3.)

Evaluate $15n + 19$ if $n = \frac{1}{3}$

4.)

Evaluate $30n$ if $n = 2.5$

5.)

Evaluate $24n \div k$ if $n = 6$ and $k = 8$

6.)

Evaluate $nk - 2b + 8$ if $b = 1.5$, $k = 8$, and $n = 7$

Summer Math Packet

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS

Objective: Evaluate numeric expressions using order of operations.

- A **numerical expression** is a combination of numbers and operations.
- The **Order of Operations** tells you which operation to perform first so that everyone gets the same final answer.
- The **Order of Operations** is: **Parentheses, Exponents, Multiplication or Division (left to right), and Addition or Subtraction (left to right.)**

Examples:

$48 \div (3 + 3) - 2^2$ original expression
 $48 \div 6 - 2^2$ simplify the expression inside the parentheses
 $48 \div 6 - 4$ calculate 2^2
 $8 - 4$ divide 48 by 6
 4 subtract 4 from 8

1.)

$$(8 + 1) \times 12 - 13$$

2.)

$$13 \times 4 - 72 \div 8$$

3.)

$$88 - 16 \times 5 + 2 - 3$$

4.)

$$100 \div 5^2 \times 4^3$$

5.)

$$45 \div 9 - 3 + 2 \times 3$$

6.)

$$(5^2 + 3^3) \times (81 + 9) \div 10$$

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS

Objective: Determine the unknown in a linear equation (addition & subtraction).

- **Addition equations:** Subtract the same number from each side of the equation so that the two sides remain equal.
- **Subtraction equations:** Add the same number to each side of the equation so that the two sides remain equal.

Examples:

$$\begin{array}{r} b + 3 = 6 \quad \text{original equation} \\ - 3 \quad - 3 \quad \text{subtract 3 from each side} \\ \hline b + 0 = 3 \quad \text{solution} \\ b = 3 \quad \text{simplify} \end{array}$$

$$\begin{array}{r} b - 8 = 4 \quad \text{original equation} \\ + 8 \quad + 8 \quad \text{add 4 to each side} \\ \hline b + 0 = 12 \quad \text{solution} \\ b = 12 \quad \text{simplify} \end{array}$$

1.)

$$g + 5 = 12$$

2.)

$$s - 12 = 29$$

3.)

$$m + 3.5 = 10.5$$

4.)

$$k - 5.5 = 8.5$$

5.)

$$w + 6.25 = 22$$

6.)

$$g - 3.75 = 49.75$$

Summer Math Packet

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS

Objective: Determine the unknown in a linear equation (multiplication & division).

- In a **multiplication equation**, the number by which a variable is multiplied is called the **coefficient**. In the multiplication equation $2x = 8$, the coefficient is 2.
- **Multiplication equations:** Divide both sides by the coefficient so that the two sides remain equal.
- In a **division equation**, the number by which the variable is divided is called the **divisor**. In the division equation $\frac{x}{4}$, 4 is the divisor.
- **Division equations:** Multiply both sides of the equation by the divisor so that the two sides remain equal.

Examples:

$$4b = 16 \quad \text{original equation}$$

$$\begin{array}{r} \underline{\quad} \\ 4 \end{array} \quad \begin{array}{r} \underline{\quad} \\ 4 \end{array} \quad \text{divide both sides by 4}$$

$$1b = 4 \quad \text{solution}$$

$$b = 4 \quad \text{simplify}$$

$$\frac{m}{6} = 11 \quad \text{original equation}$$

$$6 \times \frac{m}{6} = 11 \times 6 \quad \text{multiply each side by 6}$$

$$1m = 66 \quad \text{solution}$$

$$m = 66 \quad \text{simplify}$$

1.)

$$7x = 63$$

2.)

$$\frac{k}{9} = 8$$

3.)

$$5b = 3.55$$

4.)

$$\frac{n}{7} = 5.55$$

5.)

$$12m = 84.72$$

6.)

$$\frac{p}{13} = 2.67$$

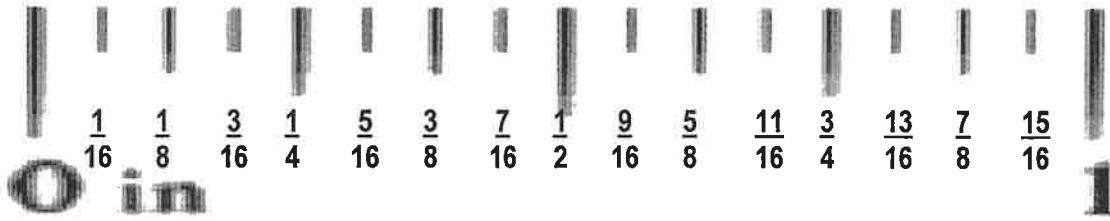
Summer Math Packet

Unit: KNOWLEDGE of MEASUREMENT

Objective: Measure length to the nearest 1/16 inch using a ruler.

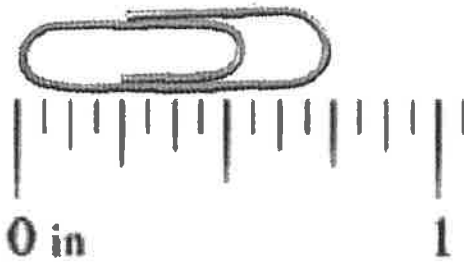


You will need a ruler for this lesson!

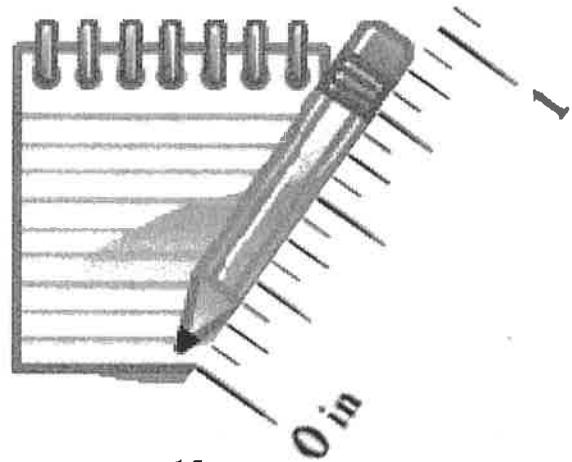


****Note:**
This ruler
is NOT to
scale.

Examples: Measure the following objects to the nearest 1/16 inch.



Paperclip = $\frac{3}{4}$ inch



Pencil = $\frac{15}{16}$ inch

Measure the objects to the nearest 1/16 inch.

<p>1.)</p>	<p>2.)</p>
<p>3.)</p>	<p>4.)</p>
<p>5.)</p>	<p>6.)</p>

Summer Math Packet *Week 3*

Unit: KNOWLEDGE of MEASUREMENT

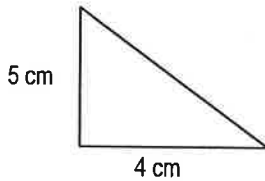
Objective: Estimate and determine the area of a triangle with whole number dimensions.



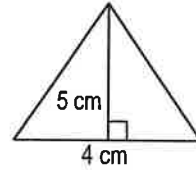
The area (A) of a triangle is one half the product of the base (b) and the height (h).

The formula for finding the area of a triangle is: $A = \frac{1}{2}bh$ and is measured in square units.

Examples:

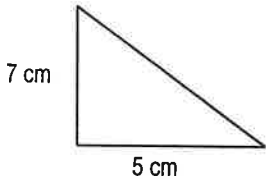


$A = \frac{1}{2}bh$ $A = \frac{1}{2} \times 4 \times 5$ $A = \frac{1}{2} \times 20$
 $A = 10 \text{ cm}^2$



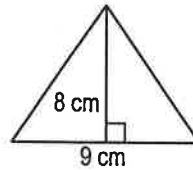
$A = \frac{1}{2}bh$ $A = \frac{1}{2} \times 4 \times 5$ $A = \frac{1}{2} \times 20$
 $A = 10 \text{ cm}^2$

1.) Determine the area of the triangle.



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

2.) Determine the area of the triangle.



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

3.) Determine the area of an obtuse triangle with a height of 11 cm and a base of 22 cm.

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

4.) Determine the area of an isosceles triangle with a base of 13 cm and a height of 26 cm.

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

5.) World famous pastry chef, Chen Lee, is designing a birthday cake for his son, who is a Geometry teacher. He has 4 layers, all triangles. He wants to put the largest layer (in area) on the bottom and the smallest layer on the top. Determine the area of each layer and order them from largest to smallest (4 = largest, 1 = smallest)

___ Milk Chocolate layer $b = 12''$ $h = 6''$ $A =$

___ Yellow cake layer $b = 7''$ $h = 11''$ $A =$

___ Dark Chocolate layer $b = 4''$ $h = 17''$ $A =$

___ White cake layer $b = 9''$ $h = 9''$ $A =$

6.) ~~Natasha's dorm room is shaped like a triangle.~~ The college brochure says it has an area of 875 square feet. The room is 35 feet long. Determine the width of the room at its widest point.

Summer Math Packet

Unit: KNOWLEDGE of MEASUREMENT

Objective: Estimate and determine the volume of rectangular prisms with whole number dimensions.

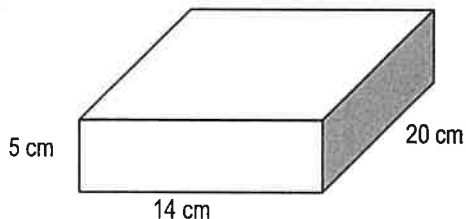


The amount of space inside a three-dimensional figure is the **volume** of the figure.

Volume (**V**) is measured in **cubic units**.

The volume of a **rectangular prism** is related to its dimensions. **Volume (V) = length (l) x width (w) x height (h)**

Examples:

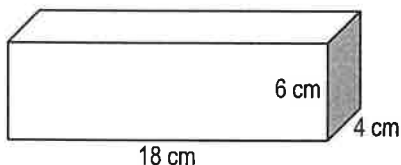


$$V = l \times w \times h$$

$$V = 20 \times 14 \times 5$$

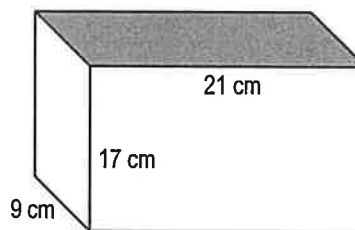
$$V = 1400 \text{ cm}^3$$

1.) Determine the volume of the rectangular prism. Please show your work.



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

2.) Determine the volume of the rectangular prism. Please show your work.



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

3.) Determine the volume of a rectangular prism with a length of 13 cm, a width of 55 cm, and a height of 65 cm. Please show your work.

4.) Determine the volume of a rectangular prism with a height of 35 cm, a length of 89 cm, and a width of 15 cm. Please show your work.

5.) Tyrone has a fish tank that measures 36 in. long, 24 in. high, and 18 in. wide. He wants to fill the fish to a height of 14 inches. What will be the volume of water in the tank? Please show your work.

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

Draw the tank and label the dimensions. Draw the water level. This does not need to be drawn to scale.

6.) Shanika has a lamp that she wants to send to her sister in Baltimore. The lamp is in the shape of a rectangular prism. It measures 14" high, 9" wide, and 3" long. She wants to buy a box so that there is 1" all around the lamp for bubble wrap.

What should be the dimensions of the box?

What is the volume of the box? Please show your work.



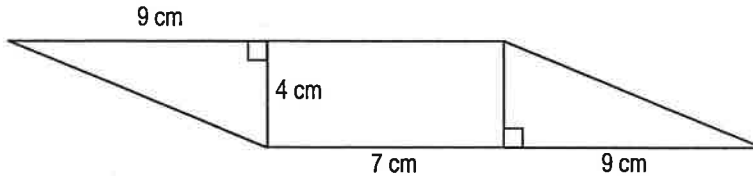
Unit: KNOWLEDGE of MEASUREMENT

Objective: Estimate and determine the area of composite figures using no more than four polygons (triangles or rectangles) with whole number dimensions.

A **composite figure** is made by **combining two different figures**.

The area of a composite figure is found by **adding the areas of the individual figures**.

Examples:



$$A = \frac{1}{2} bh$$

$$A = \frac{1}{2} \times 4 \times 9$$

$$A = 18 \text{ cm}^2$$

$$A = lw$$

$$A = 7 \times 4$$

$$A = 28 \text{ cm}^2$$

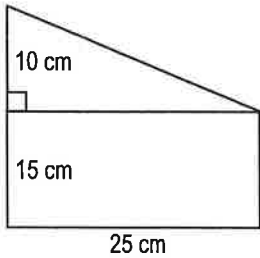
$$A = \frac{1}{2} bh$$

$$A = \frac{1}{2} \times 4 \times 9$$

$$A = 18 \text{ cm}^2$$

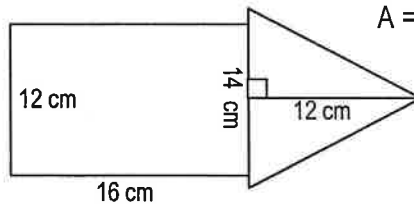
$$\text{Area of composite figure} = 18 + 28 + 18 = 64 \text{ cm}^2$$

1.) Determine the area of the composite figure. Please show your work.



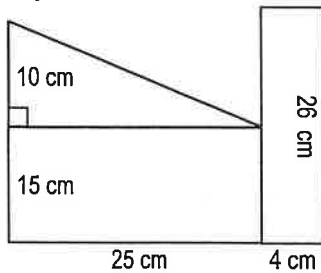
$$A = \underline{\hspace{2cm}}$$

2.) Determine the area of the composite figure. Please show your work.



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

3.) Determine the area of the composite figure. Please show your work.



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

4.) Determine the area of the composite figure that is made up of 1 square and 3 congruent right triangles. Each triangle shares its base with one side of the square. One side of the square measures 6cm. The height of each triangle is 4 times its base. Please show your work.

5.) Dallas is working on the decorations for the 8th grade dance. He is making a large composite wall decoration that is made of 2 congruent rectangles and 2 congruent triangles. The rectangles measure 5 ft by 7 ft. The triangles have a base of measurement of 7 ft and a height measurement of 9 ft. What is the composite area of the wall decoration?

What is the composite area of 4 of them?

6.) The 8th grade dance committee liked Dallas' decorations so much that they decided to paint a huge one on the floor. They tripled the dimensions of the rectangles and the triangles?

What is the area of the floor decoration?

Summer Math Packet

Unit: KNOWLEDGE of MEASUREMENT

Objective: Determine the missing side of a quadrilateral given the perimeter using whole number dimensions.

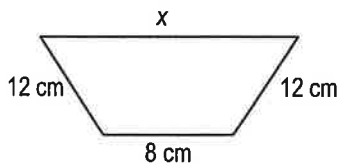


A **quadrilateral** is any four-sided, closed, 2-dimensional figure.

The **perimeter (P)** of any quadrilateral is the sum of the lengths of its four sides.

The **missing side** of a quadrilateral can be found using addition and subtraction.

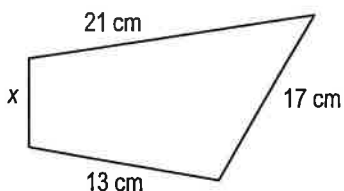
Examples:



$P = 52 \text{ cm}$

$$\begin{aligned}
 P &= s + s + s + s \\
 52 &= 12 + 8 + 12 + x \\
 52 &= 32 + x \\
 -32 & \quad -32 \\
 \hline
 20 &= x \quad \text{The length of the missing side is 20 cm.}
 \end{aligned}$$

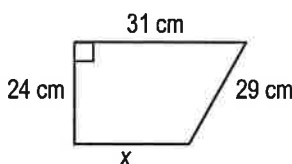
1.) Determine the missing side of the quadrilateral. Please show your work.



$P = 60 \text{ cm}$

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

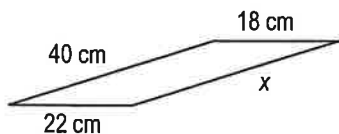
2.) Determine the missing side of the quadrilateral. Please show your work.



$P = 99 \text{ cm}$

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

3.) Determine the missing side of the quadrilateral. Please show your work.



$P = 124 \text{ cm}$

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

4.) Determine the missing side of a quadrilateral that has a perimeter of 251 cm and three sides measuring 39 cm, 72 cm, and 89 cm. Please show your work.

5.) Heather wants to build a pen for her new beagle puppy. She is going to build it in the shape of a quadrilateral. She decides that she wants the perimeter to be 360 ft. She already has 360 feet of fence. She measures out the first side to be 90 ft, the second side to be 110 feet, and the third side to be 100 feet. She tells her friend to measure out the fourth side to be 80 feet.

Is this correct? Why or why not? Please show your work.

6.) Michael is designing a corn maze for his grandfather's farm. The general shape of the corn maze is a quadrilateral. The perimeter of the corn maze is 1,221 feet. The top measures 381 feet. The bottom measures 227 feet. One of the sides measures 294 feet.

Determine the length of the other side. $\underline{\hspace{2cm}}$

Is this missing side shorter or longer than the other side? Please show your work to prove your answer.

Summer Math Packet *Week 5*

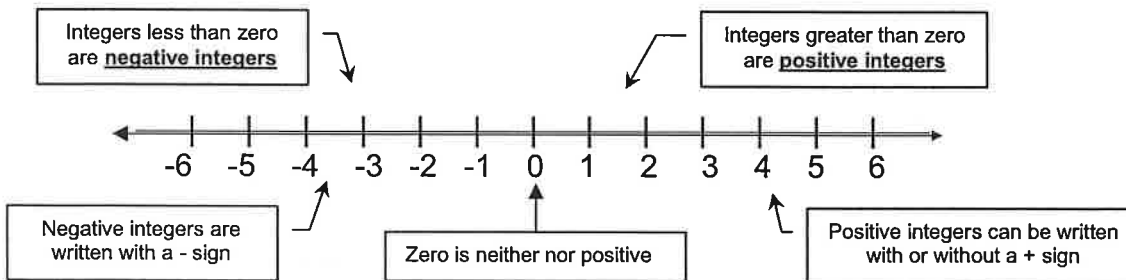
Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Read, write, and represent integers.



Examples:

Integer: Any number from the set {... -3,-2,-1,0,1,2,3...}



Write an integer to describe each situation

- EX:** a height increase of 3 inches
The word increase represents positive. The integer is 3 or +3.
- EX:** 50 feet below sea level
The word below represents negative. The integer is -50.

<p>1.) Write an integer to describe: <i>The stock market increased 75 points</i></p>	<p>2.) Write an integer to describe: <i>A loss of 15 yards</i></p>
<p>3.) Write an integer to describe the situation: <i>Nancy owes her friend \$10</i></p>	<p>4.) Write an integer to describe: <i>Frederick is located 290 feet above sea level.</i></p>
<p>5.) Write an integer to describe: <i>The temperature was 3° below zero</i></p>	<p>6.) Write an integer to describe: <i>The 6th grade has 12 fewer students than last year</i></p>

Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Identify and determine equivalent forms of proper fractions as decimals, percents, and ratios - A.

Examples: Write $\frac{21}{25}$ as a decimal

Method 1:

Change $\frac{21}{25}$ to a fraction with a denominator of 10, 100, or 1000

EX: $\frac{21}{25} = \frac{?}{100}$

(Use 100, since 25 divides into 100 evenly)

$$\frac{21}{25} = \frac{x4}{x4} = \frac{84}{100} \quad \frac{84}{100} = 0.84 \text{ as a decimal}$$

Method 2: Divide 21 by 25

$$\begin{array}{r} \frac{21}{25} \rightarrow 25 \overline{)21.00} \\ \underline{0.84} \\ 21.00 \\ \underline{-200} \\ 100 \\ \underline{-100} \\ 0 \end{array}$$

Therefore: $\frac{21}{25} = 0.84$

1.) Write $\frac{19}{20}$ as a decimal. Use method 1

2.) Write $\frac{7}{8}$ as a decimal. Use method 2.

3.) Write $\frac{3}{16}$ as a decimal. Use method 2

4.) Write $\frac{27}{40}$ as a decimal. Use method 2

5.) Write $\frac{3}{4}$ as a decimal. Use method 1

6.) Write $\frac{3}{5}$ as a decimal. Use method 1

Summer Math Packet *Week 6*

Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Identify and determine equivalent forms of proper fractions as decimals, percents, and ratios - B.

Key Concept: Percent (%) is a ratio that compares a number to 100

Fraction to Percent:

EX: Change $\frac{19}{25}$ to a percent

Since % means out of 100, $\frac{19}{25} = \frac{?}{100}$

$$\frac{19}{25} = \frac{x4}{x4} = \frac{76}{100}$$

$$\frac{76}{100} = 76\%$$

Percent to fraction:

EX: Change 75% to a fraction in simplest form

75% means 75 out of 100

$$75\% = \frac{75}{100} \quad \text{Write the percent as a fraction with a denominator of 100}$$

$$\frac{75 \div 25}{100 \div 25} = \frac{3}{4} \quad \text{Simplify}$$

1.) Change $\frac{17}{20}$ to a percent

2.) Change 84% to a fraction in simplest form

3.) Change $\frac{3}{4}$ to a percent

4.) Change 90% to a fraction in simplest form

5.) Juan answered $\frac{24}{25}$ questions correctly on his quiz.
What percent of the questions did he get correct?

6.) 78% of the class completed their homework last night. What fraction of the class completed their homework?