Algebra – Summer Math Packet

Unit: Knowledge of Number Relationships & Computation

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

Examples:

   A RATIO is a comparison of two numbers by division. When a ratio compares a number to 100, it can be written as a PERCENT. To write a ratio or fraction as a percent, find an equivalent fraction with a denominator of 100. You can also use the meaning of percent to change percents to fractions.

Write $\dfrac{19}{20}$ as a percent.

$$\dfrac{19}{20} \dfrac{\bullet\, 5}{\bullet\, 5} = \dfrac{95}{100} = 95\%$$ **Since 100 ÷ 20 = 5, multiply the numerator and denominator by 5.**

Write 92% as a fraction in simplest form.

$$\dfrac{92}{100} = \dfrac{\div\, 4}{\div\, 4} = \dfrac{23}{25}$$

Write 92% as a decimal.   **Move decimal two places to the left. Add zeros if needed.**   **92.0% = 0.92**

Write 0.4 as a percent.   **Move decimal two places to the right. Add zeros if needed.**   **0.4 = 40%**

1.) Write $\dfrac{7}{25}$ as a percent and decimal.	**2.)** Write 19% as a decimal and fraction in simplest form.
3.) Write $\dfrac{9}{50}$ as a percent and decimal.	**4.)** Write 75% as a decimal and fraction in simplest form.
5.) Ms. Crest surveyed her class and found that 15 out of 30 students brushed their teeth more than twice a day. Write this ratio as a fraction in simplest form, then write it as a % and a decimal.	**6.)** A local retail store was having a sale and offered all their merchandise as a 25% discount. Write this percent as a fraction in simplest form, then write it as a decimal.

On a scale of 1 – 5 (1: Weak, 5: Strong) rate yourself on this section of math: 1   2   3   4   5

Algebra – Summer Math Packet

Unit: Knowledge of Number Relationships & Computation
Objective: Add, subtract, multiply and divide integers. - **A**
Examples:
ADDITION INTEGER RULES:
   For integers with the same sign:
   - **The sum of two positive integers is POSITIVE.**
   - **The sum of two negative integers is NEGATIVE.**
   For integers with different signs, subtract their absolute value.   The sum is:
   - **Positive IF the positive integer has the greater absolute value.**
   - **Negative IF the negative integers has the greater absolute value.**

Examples:
  - 6 + (- 3) = add keep the sign = - 9   **- 34 + (- 21) = add keep the sign = - 55**

  8 + (- 7) = subtract keep the sign of the higher = 1   **- 5 + 4 = subtract keep the sign of the higher = - 1**

SUBTRACTION INTEGER RULES:
   - **Keep the first number the same**
   - **Switch the subtraction sign to ADDITION**
   - **Change the second number to it's opposite. Opposite: - 6 to 6**
   - **Follow Addition rules above.**

Examples:
  6 – 9 = 6 + (- 9) = -3   **- 10 – (- 12) = - 10 + 12 = 2**

  - 3 – 7 = - 3 + (- 7) = - 10   **1 – (- 2) = 1 + 2 = 3**

1.) Add: 2 + (- 7)	**2.)** Subtract: - 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° C in January. The temperature in July may reach 40° 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.

Algebra – Summer Math Packet

Unit: Knowledge of Number Relationships & Computation
Objective: Add, subtract, **multiply and divide** integers. - **B**
Examples:

MULTIPLYING & DIVIDING INTEGER RULES:
- Two integers with DIFFERENT signs the answer is NEGATIVE.
- Two integers with SAME signs the answer is POSITIVE.

Examples:

5 (- 2) = 5 times – 2, the signs are different so the answer will be negative = - 10

(- 6) • (- 9) = the signs are the same so the answer will be positive = 54

30 ÷ (- 5) = the signs are different so the answer will be negative = - 6

- 100 ÷ (- 5) = the signs are the same so the answer will be positive = 20

1.) Mulitply: - 14 (- 7)	**2.)** Divide: 350 ÷ (- 25)
3.) Evaluate if a = - 3 and c = 5 - 3ac	**4.)** Evaluate if d = - 24, e = - 4, and f = 8 $\dfrac{de}{f}$
5.) A computer stock decreased 2 points each hour for 6 hours. Determine the total change in the stock value over the 6 hours.	**6.)** A submarine descends at a rate of 60 feet each minute. How long will it take it to descend to a depth of 660 feet below the surface?

Algebra – Summer Math Packet

Unit: Knowledge of Algebra, Patterns, and Functions
Objective: Solve for the unknown in an inequality with one variable.

An **inequality** is a mathematical sentence that contains the symbols $\langle$, $\rangle$, $\leq$, 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 $2x + 8 < 24$

$2x + 8 < 24$ Write the inequality
$\underline{- 8 \quad - 8}$ Subtract 8 from each side
$\dfrac{2x}{2} < \dfrac{16}{2}$ Simplify
 Divide each side by 2
$x < 8$ Simplify

Example 1: Solve $v + 3 < 5$

$v + 3 < 5$ Write the inequality
$\underline{- 3 \quad - 3}$ Subtract 3 from each side
$v < 2$ Simplify

Check: Try 1, a number less than 2
$v + 3 < 5$ Write the inequality
$1 + 3 < 5$ Replace v with 1
$4 < 5?$ Is this sentence true? **yes**

Check: Try 7, a number less than 8
$2x + 8 < 24$ Write the inequality
$2(7) + 8 < 24$ Replace x with 7
$14 + 8 < 24$ Multiply 7 by 2
$22 < 24?$ Is the sentence true? **yes**

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 you can buy?

On a scale of 1 – 5 (1: Weak, 5: Strong) rate yourself on this section of math: 1   2   3   4   5

Algebra – Summer Math Packet

Unit: Knowledge of Algebra, Patterns, and Functions
**Objective:** Determine the unknown in a linear equation with 1 or 2 operations

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

x + 5 = 11	Write the equation
- 5 = - 5	Subtract 5 from both sides
x = 6	Simplify

Check
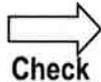
x + 5 = 11	Write the equation
6 + 5 = 11	Replace x with 6
11 = 11✓	The sentence is true

Example 2: Solve - 21 = - 3y

- 21 = - 3y	Write the equation
- 3 = - 3	Divide each side by – 3
7 = y	Simplify

Check
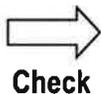
- 21 = - 3y	Write the equation
- 21 = - 3(7)	Replace the y with 7
-21 = - 21?	Multiply – is the sentence true?

Example 3: Solve 3x + 2 = 23

3x + 2 = 23	Write the equation
- 2 = - 2	Subtract 2 from each side
3x = 21	Simplify
3 3	Divide each side by 3
x = 7	Simplify

Check
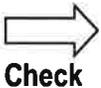
3x + 2 = 23	Write the equation
3(7) + 2 = 23?	Replace x with 7
21 + 2 = 23?	Multiply
23 = 23?	Add – is the sentence true?

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?

On a scale of 1 – 5 (1: Weak, 5: Strong) rate yourself on this section of math: 1   2   3   4   5

Algebra – Summer Math Packet

Unit: Knowledge of Algebra, Patterns, and Functions
Objective: Identify or graph solutions of inequalities on a number line.

**Examples:** Graph each inequality on a number line.

$x < 2$

The open circle means that the number is **not** included in the solution.

$y \geq 8$
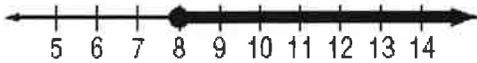
The closed circle means that the number **is** included in the solution.

$m < -3$
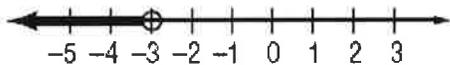
The solution is all numbers less than negative three.
-3 is **not** included in the solution.

1.) Write an inequality for the graph.	2.) Write an inequality for the graph.
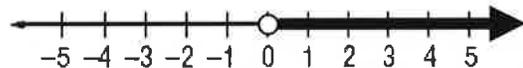
| 3.) Graph the inequality.	4.) Graph the inequality.
$b \geq -1$	$z < 3$
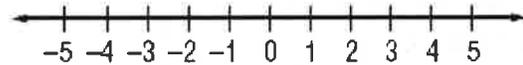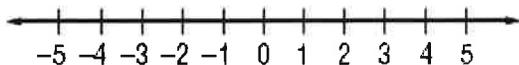
5.) Solve the inequality, then graph it on the number line.	6.) Solve the inequality, then graph it on the number line.
$y + 9 \leq 13$	$4x - 6 > -10$
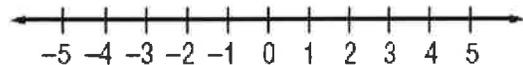
On a scale of 1 – 5 (1: Weak, 5: Strong) rate yourself on this section of math: 1   2   3   4   5

Algebra – Summer Math Packet

Unit: Knowledge of Algebra, Patterns, and Functions
Objective: Graph ordered pairs in a coordinate plane.

> The **coordinate plane** is used to locate points. The horizontal number line is the **x-axis**. The vertical number line is the **y-axis**. Their intersection is the **origin**.
> Points are located using **ordered pairs**. The first number in an ordered pair is the **x-coordinate**; the second number is the **y-coordinate**.
> The coordinate plane is separated into four sections called **quadrants**.

Example 1: Name the ordered pair for point P. Then identify the quadrant in which P lies.
- Start at the origin.
- Move 4 units left along the x-axis.
- Move 3 units up on the y-axis.
The ordered pair for point P is (- 4, 3).
P is in the upper left quadrant or quadrant II.

Quadrant 2   Quadrant 1
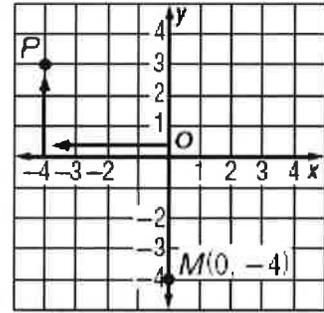
Quadrant 3   Quadrant 4

Example 2: Graph and label the point M (0, - 4).
- Start at the origin.
- Move 0 units along the x-axis.
- Move 4 units down on the y-axis.
- Draw a dot and label it M(0, - 4).

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 (__, __)	__
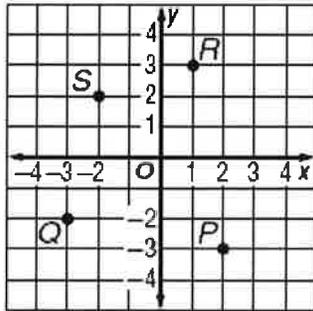
2.) Find each of the points below on the coordinate plane. Then identify the quadrant in which each point lies.

| Coordinates	Quadrant
A (__, __)	__
J (__, __)	__
B (__, __)	__
H (__, __)	__
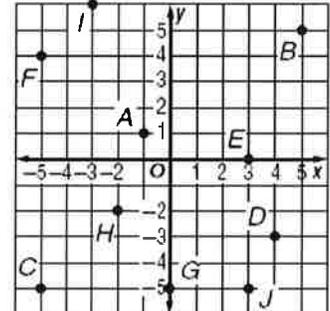
3.) Graph and label each point on the coordinate plane.

N   (3, -1)

P   (-2, 4)

Q   (-3, -4)

R   (0, 0)

S   (-5, 0)
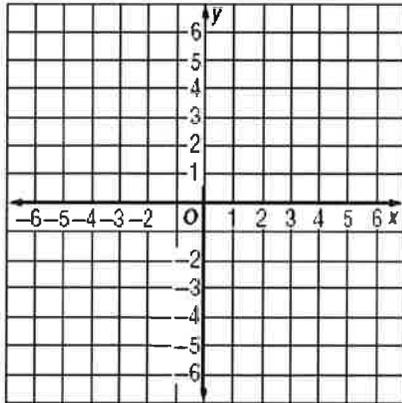
4.) Graph and label each point on the coordinate plane.

D   (0, 4)

E   (5, 5)

G   (-3, 0)

H   (-6, -2)

J   (0, -2)

On a scale of 1 – 5 (1: Weak, 5: Strong) rate yourself on this section of math: 1   2   3   4   5