

2018

MAGRUDER HIGH SCHOOL

ALGEBRA 1
SUMMER PACKET

In order to be successful in Algebra 1, you must have certain prerequisite skills mastered. You will be assessed on the content of this packet during the first week of school.

Please make your best effort as you work on this packet. You can work with another person, but keep in mind that each person has to take the quiz. Please show all of your work.

Enjoy your summer!! We look forward to meeting you and working with you when return to school in the fall.

The Algebra 1 Team

Integers I

Hints/Guide:

To add integers with the same sign (both positive or both negative), add their absolute values and use the same sign. To add integers of opposite signs, find the difference of their absolute values and then take the sign of the larger absolute value.

To subtract integers, add its additive inverse. For example, $6 - 11 = 6 + -11 = -5$

Exercises: Solve the following problems.

1. $(-4) + (-5) =$

2. $-9 - (-2) =$

3. $6 - (-9) =$

4. $(-6) - 7 =$

5. $7 - (-9) =$

6. $15 - 24 =$

7. $(-5) + (-8) =$

8. $-15 + 8 - 8 =$

9. $14 + (-4) - 8 =$

10. $14.5 - 29 =$

11. $-7 - 6.85 =$

12. $-8.4 - (-19.5) =$

13. $29 - 16 + (-5) =$

14. $-15 + 8 - (-19.7) =$

15. $45.6 - (-13.5) + (-14) =$

16. $-15.98 - 6.98 - 9 =$

17. $-7.24 + (-6.28) - 7.3 =$

18. $29.45 - 56.009 - 78.2 =$

19. $17.002 + (-7) - (-5.23) =$

20. $45.9 - (-9.2) + 5 =$

Integers II

Hints/Guide:

The rules for multiplying integers are:

$$\text{Positive} \cdot \text{Positive} = \text{Positive}$$

$$\text{Positive} \cdot \text{Negative} = \text{Negative}$$

$$\text{Negative} \cdot \text{Negative} = \text{Positive}$$

$$\text{Negative} \cdot \text{Positive} = \text{Negative}$$

The rules for dividing integers are the same as multiplying integers

Exercises: Solve the following problems.

1. $4 \cdot (-3) \cdot 6 =$

2. $5(-12) \cdot (-4) =$

3. $(4)(-2)(-3) =$

4. $\frac{(-5)(-6)}{-2} =$

5. $\frac{6(-4)}{8} =$

6. $\frac{-56}{2^3} =$

7. $6(-5 - (-6)) =$

8. $8(-4 - 6) =$

9. $-6(9 - 11) =$

10. $\frac{-14}{2} + 7 =$

11. $8 - \frac{-15}{-3} =$

12. $-3 + \frac{-12 \cdot (-5)}{4} =$

13. $\frac{-6 - (-8)}{-2} =$

14. $-7 + \frac{4 + (-6)}{-2} =$

15. $45 - 14(5 - (-3)) =$

16. $(-4 + 7)(-16 + 3) =$

17. $16 - (-13)(-7 + 5) =$

18. $\frac{4 + (-6) - 5 - 3}{-6 + 4} =$

19. $(-2)^3(-5 - (-6)) =$

20. $13(-9 + 17) + 24 =$

Solving Equations I

Hints/Guide:

The key in equation solving is to isolate the variable, to get the letter by itself. In one-step equations, we merely undo the operation - addition is the opposite of subtraction and multiplication is the opposite of division. Remember the golden rule of equation solving: If we do something to one side of the equation, we must do the exact same thing to the other side. Examples:

$$1. \quad x + 5 = 6$$

$$\quad \quad \quad \underline{-5 \quad -5}$$

$$\quad \quad \quad x = 1$$

$$\quad \quad \quad \text{Check: } 1 + 5 = 6$$

$$\quad \quad \quad \quad \quad 6 = 6$$

$$3. \quad \frac{4x}{4} = \frac{16}{4}$$

$$\quad \quad \quad \frac{4x}{4} = 4$$

$$\quad \quad \quad x = 4$$

$$\quad \quad \quad \text{Check: } 4(4) = 16$$

$$\quad \quad \quad \quad \quad 16 = 16$$

$$2. \quad t - 6 = 7$$

$$\quad \quad \quad \underline{+6 \quad +6}$$

$$\quad \quad \quad t = 13$$

$$\quad \quad \quad \text{Check: } 13 - 6 = 7$$

$$\quad \quad \quad \quad \quad 7 = 7$$

$$4. \quad 6 \cdot \frac{r}{6} = 12 \cdot 6$$

$$\quad \quad \quad r = 72$$

$$\quad \quad \quad \text{Check: } 72 \div 6 = 12$$

$$\quad \quad \quad \quad \quad 12 = 12$$

Exercises: Solve the following problems:

No Calculators!

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

$$1. \quad x + 8 = -13$$

$$2. \quad t - (-9) = 4$$

$$3. \quad -4t = -12$$

$$4. \quad \frac{r}{4} = 24$$

$$5. \quad y - 4 = -3$$

$$6. \quad h + 8 = -5$$

$$7. \quad \frac{p}{8} = -16$$

$$8. \quad -5k = 20$$

$$9. \quad -9 - p = 17$$

Solving Equations II

Hints/Guide:

The key in equation solving is to isolate the variable, to get the letter by itself. In two-step equations, we must undo addition and subtraction first, then multiplication and division. Remember the golden rule of equation solving: If we do something to one side of the equation, we must do the exact same thing to the other side. Examples:

$$1. 4x - 6 = -14$$

$$\begin{array}{r} +6 \quad +6 \\ \hline 4x \quad = -8 \end{array}$$

$$\begin{array}{r} 4 \quad 4 \end{array}$$

$$x = -2$$

$$\text{Solve: } 4(-2) - 6 = -14$$

$$-8 - 6 = -14$$

$$-14 = -14$$

$$2. \frac{x}{-6} - 4 = -8$$

$$\begin{array}{r} +4 \quad +4 \end{array}$$

$$-6 \cdot \frac{x}{-6} = -4 \cdot -6$$

$$x = 24$$

$$\text{Solve: } (24/-6) - 4 = -8$$

$$-4 - 4 = -8$$

$$-8 = -8$$

Exercises: Solve the following problems:

No Calculators!

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

$$1. -4t - 6 = 22$$

$$2. \frac{m}{-5} + 6 = -4$$

$$3. -4r + 5 = -25$$

$$4. \frac{x}{-3} + (-7) = 6$$

$$5. 5g + (-3) = -12$$

$$6. \frac{y}{-2} + (-4) = 8$$

Rounding Numbers

Hints/Guide:

- 1) Underline the place value in which you want to round.
- 2) Look at the number to the right of that place value you want to round
- 3) -If the number to the right of the place value you want to round is less than 5, keep the number the same and drop all the other numbers

-If the number to the right of the place value you want to round is 5 or more, round up and drop the rest of the numbers.

Example: Round the following numbers to the tenths place

1. 23.1246



2 is less than 5 so keep the 1 the same

23.1

2. 64.2685



6 is greater than 5 so add one to the 2

64.3

3. 83.9721



7 is greater than 5 so add one to the 9

84

Exercises: Round the following numbers to the tenth place.

1. 18.6231

6. 0.2658

2. 25.0543

7. 100.9158

3. 3.9215

8. 19.9816

4. 36.9913

9. 17.1083

5. 15.9199

10. 0.6701

Evaluating Expressions

Hints/Guide:

The key to evaluating algebraic expressions is to substitute a number for each variable and perform the arithmetic operations.

Examples: Evaluate the following expression when $x = 5$

Rewrite the expression substituting 5 for the x and simplify.

- a. $5x = 5(5) = 25$
- b. $-2x = -2(5) = -10$
- c. $x + 25 = 5 + 25 = 30$
- d. $5x - 15 = 5(5) - 15 = 25 - 15 = 10$
- e. $3x + 4 = 3(5) + 4 = 15 + 4 = 19$

Exercises: Evaluate each expression given that: $x = 5$ $y = 4$ $z = 6$

1. $3x$

5. $y + 4$

2. $2x^2$

6. $5z - 6$

3. $3x^2 + y$

7. $xy + z$

4. $2(x + z) - y$

8. $2x + 3y - z$

Combining like terms

Hints/Guide:

- Terms are the part of an algebraic expression that are separated by an addition or subtraction sign. The expression $4x - 2y + 3$ has 3 terms
- Like terms are terms with the same variable factors. $2n$ and $3n$ are like terms, but $4x$ and $3y$ are not like terms because their variables x and y are different.

Example:

Simplify.

1. $5x + 8x$
 $13x$

3. $3x + 4 - 2x + 3$
 $x + 7$

2. $3y - 6y$
 $-3y$

4. $2b + 5c + 3b - 6c$
 $5b - c$

Exercises: Simplify each expression.

1. $6n + 5n$

2. $37z + 4z$

3. $x - 5x$

4. $3n + 1 - 2n + 8$

5. $7t + 9 - 4t + 3$

6. $4r + 3r + 6y - 2y$

7. $8g + 9h - 4g - 5h$

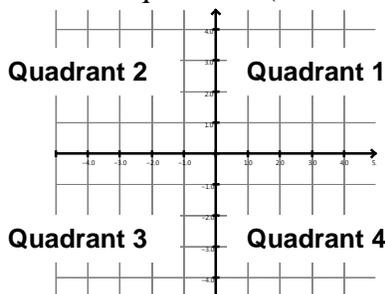
8. $2m + 3n - 4m + 5n$

Graphing

Hints/Guide:

Points in a plane using 2 numbers, called a coordinate pair. The first number is called the x-coordinate. The x-coordinate is positive if the point is to the right of the origin and negative if the point is to the left of the origin. The second number is called the y-coordinate. The y-coordinate is positive if the point is above the origin and negative if the point is below the origin.

The x-y plane is divided into 4 quadrants (4 sections) as described below.



Quadrant 1 has a **positive** x-coordinate and a **positive** y-coordinate (+ x, + y).

Quadrant 2 has a **negative** x-coordinate and a **positive** y-coordinate (- x, + y).

Quadrant 3 has a **negative** x-coordinate and a **negative** y-coordinate (- x, - y).

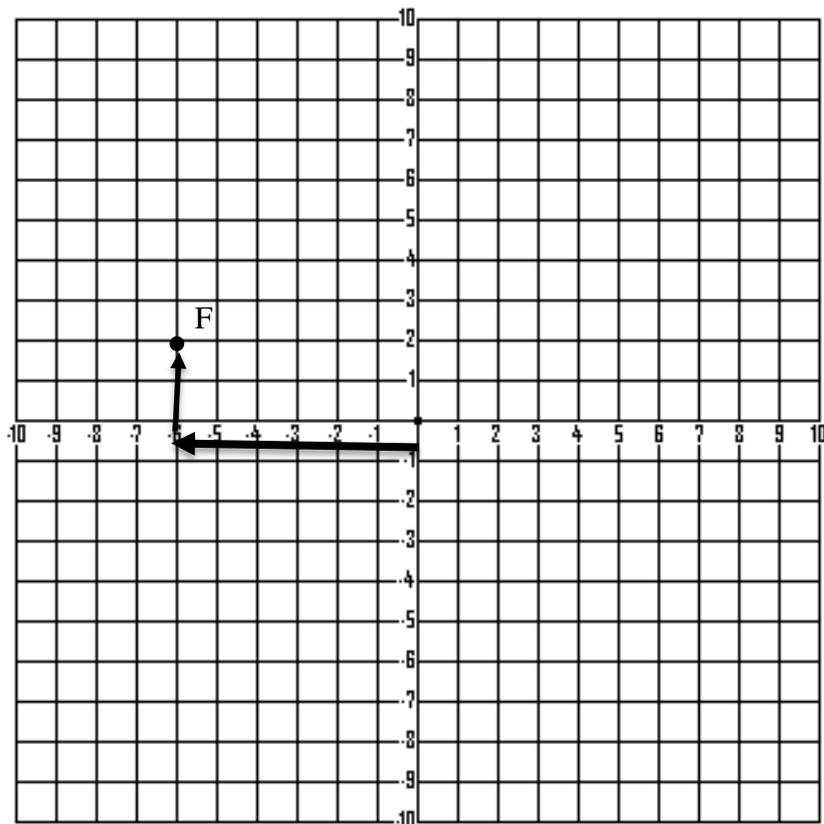
Quadrant 4 has a **positive** x-coordinate and a **negative** y-coordinate (+ x, - y).

Exercises:

Plot each point on the graph below. Remember, coordinate pairs are labeled (x, y). Label each point on the graph with the letter given.

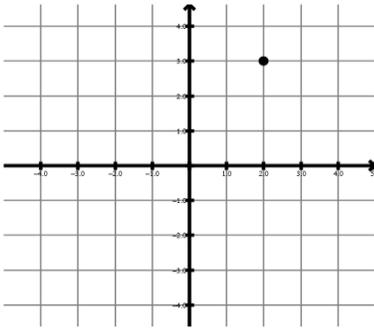
1. A(3, 4)
2. B(4, 0)
3. C(-4, 2)
4. D(-3, -1)
5. E(0, 7)

Example:
F(-6, 2)

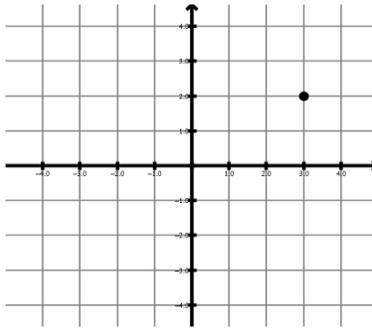


Determine the coordinates for each point below:

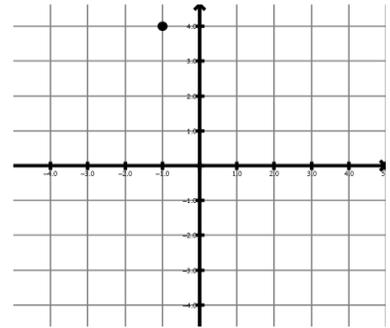
Example. (2, 3)



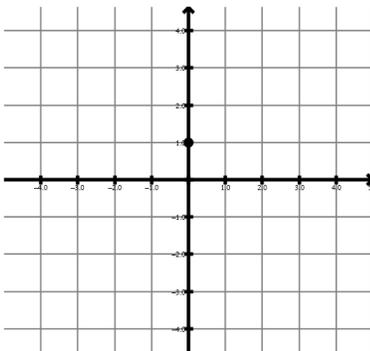
6. (____, ____)



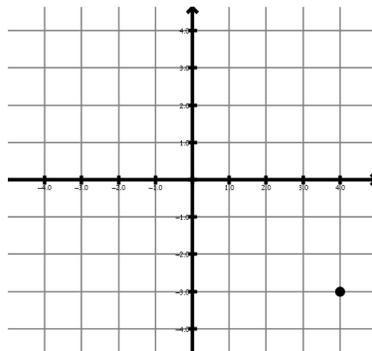
7. (____, ____)



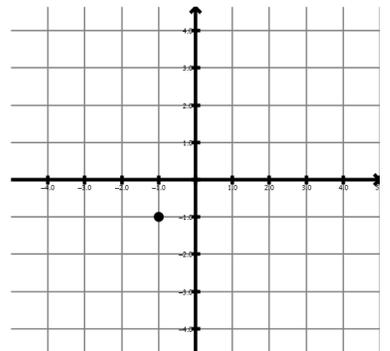
8. (____, ____)



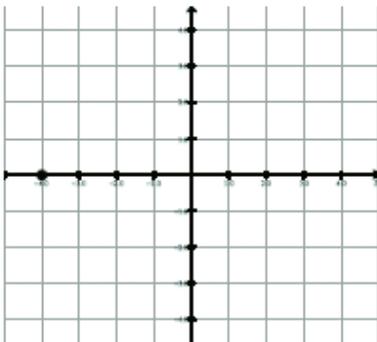
9. (____, ____)



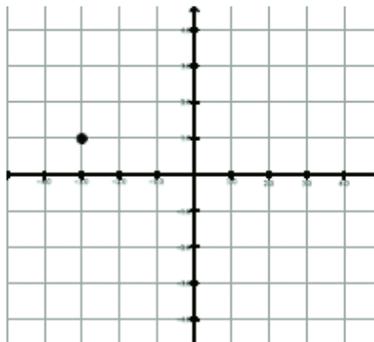
10. (____, ____)



11. (____, ____)



12. (____, ____)



13. (____, ____)

