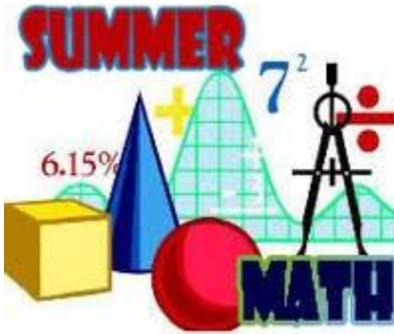


Name: \_\_\_\_\_



Attached is an assignment containing items necessary for you to have mastered to do well in Functions and Applications.

**Please complete the assignment for the class you will begin in September 2019.**

Practicing mathematics skills is especially important over the long summer break, so this summer assignment is meant to be completed over the entire summer, not all at once.

**This assignment must be completed and handed in by the second day of school.** The packet will be graded for completion and assigned an individual practice grade. To earn the full points for completion, you must show your work. **No late submissions of the summer assignment will be accepted;** please be prepared to hand it in on time.

Your teacher will review the assignment and may follow up with a formative assessment.

You may wish to utilize the following online resources:

- [www.khanacademy.com](http://www.khanacademy.com)
- [www.ixl.com](http://www.ixl.com)
- [www.purplemath.com](http://www.purplemath.com)
- [www.math.com](http://www.math.com)

Enjoy your summer!

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## Functions and Applications – Summer Packet 2019

### Part 1: Vocabulary

Match each term with the most appropriate definition.

Equation	Exponent	Expression	Origin	Quadrants
Greatest Common Factor	Integers	Quotient	Reciprocal	Absolute Value
Function	Product	Slope of a Line	Solution Set	Least Common Multiple
Sum	Variable	Difference	Rational Number	Ordered Pairs
Base	Coefficient	Factors	Monomial	

- 1) \_\_\_\_\_ A mathematical sentence that contains an equals sign
- 2) \_\_\_\_\_ A mathematical phrase that may contain numbers, variables, and operations  
(does not contain =, <, >, etc.)
- 3) \_\_\_\_\_ A symbol that is used to represent a number
- 4) \_\_\_\_\_ Used to locate points (x, y) in a coordinate plane
- 5) \_\_\_\_\_ The solution to an addition problem
- 6) \_\_\_\_\_ The solution to a subtraction problem
- 7) \_\_\_\_\_ The solution to a multiplication problem
- 8) \_\_\_\_\_ The solution to a division problem
- 9) \_\_\_\_\_ The set of numbers that contains the positive and negative whole numbers
- 10) \_\_\_\_\_ A number that can be expressed in the form  $\frac{a}{b}$ , where  $a$  and  $b$  are integers, and  
 $b \neq 0$
- 11) \_\_\_\_\_ The distance of a number from zero on a number line
- 12) \_\_\_\_\_ The quantities that are being multiplied in a multiplication expression
- 13) \_\_\_\_\_ The greatest number that is a factor of two or more integers
- 14) \_\_\_\_\_ The least positive integer that is divisible by each of 2 or more integers
- 15) \_\_\_\_\_ The  $x$  in an expression of the form  $x^n$
- 16) \_\_\_\_\_ The  $n$  in an expression of the form  $x^n$
- 17) \_\_\_\_\_ The numerical factor of a monomial
- 18) \_\_\_\_\_ A relation with exactly one output for each input
- 19) \_\_\_\_\_ An expression that is a number, a variable, or the product of a number and  
variables (ex:  $3xy^2$ )
- 20) \_\_\_\_\_ The point (0, 0) where the x-axis and y-axis intersect in the coordinate plane
- 21) \_\_\_\_\_ The multiplicative inverse of any nonzero real number
- 22) \_\_\_\_\_ Value(s) that, when substituted for a variable, make(s) the equation true
- 23) \_\_\_\_\_ The ratio of vertical change (the rise) over the horizontal change (the run) for a  
non-vertical line

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24) \_\_\_\_\_ The four regions into which the x- and y-axis separate the coordinate plane

### Part 2: Open Ended

Read the directions for each section of the following problems. SHOW ALL WORK.

Attach separate pages for work as needed.

#### #1-2: Evaluate each expression. (Evaluating Expressions Using Order of Operations)

1.  $(25 \div 5 + 3)^2 \div 16$

2.  $(3 \cdot 6 - 4 \cdot 5)$

#### #3-6: Evaluate each expression given $a = 2$ , $b = -2$ , and $c = -3$ . (Evaluating Mathematical Expressions)

3.  $abc - a(b - c)$

4.  $-a^2 - b^2 - 2c$

5.  $\frac{\sqrt{2a} - 2b - c}{|abc|}$

6.  $\frac{a^2b^2 + 2}{a^2b^2 - 1}$

#### #7-12: Solve each equation for $x$ . (Solving Multi-Step Algebra Equations)

7.  $x - 3 = 4x + 15$

8.  $-x + 3 = 7x + 8$

9.  $5(3 - 4x) = 7 - (4 - x)$

10.  $7x + 14 - 3x = 4x + 14$

11.  $2 - \frac{1}{2}x = 4 - \frac{1}{4}x$

12.  $12x - (6 - 8x) = \frac{1}{2}(8x - 12)$

#### #13-16: Solve for $y$ in terms of $x$ . (Solving Literal Equations)

13.  $4x + 8y = 17$

14.  $\frac{3}{4}x + 5y = 20$

15.  $P = 2x + 2y$

16.  $\frac{2}{3}x - \frac{1}{2}y = 12$

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**#17-22: Write each expression in simplest form. Answers should contain no negative exponents.  
(Simplifying Exponential Expressions)**

17.  $h(h^{-3})^{-10}$

18.  $(m^2)^8(n^0)^4$

19.  $\frac{x^6y^9}{x^2y^5}$

20.  $\frac{21m^3}{3m^2}$

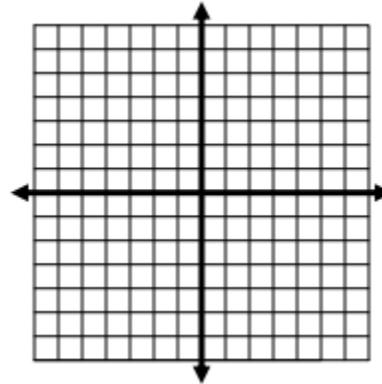
21.  $\left(\frac{5x}{3y}\right)^2$

22.  $\left(\frac{3x^4}{2y^3}\right)^3$

**#23-24: Graph each relation on the coordinate plane. Then, determine if the relation is a function or not a function. Explain. (Graphing Using a Table of Values)**

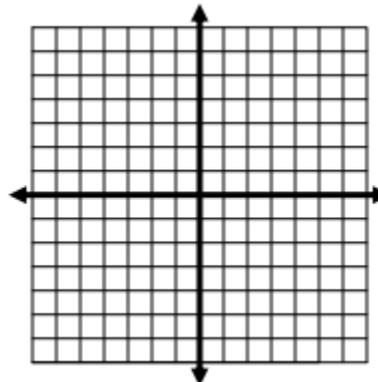
23.

x	-2	-1	0	1	2
y	-1	-1	0	1	1



24.

x	-2	-1	0	1	-1
y	-4	-1	0	1	4



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

**#25-28: Evaluate each function for the given value. (Evaluating Functions)**

25.  $f(x) = -x + 3$  for  $f(-2)$

26.  $f(x) = -5 + 8x^2$  for  $f\left(\frac{1}{2}\right)$

27.  $f(x) = |x + 3| - 9$  for  $f(-4)$

28.  $f(x) = 2x^3 - 7x^2 + 8$  for  $f(-3)$

**29. Find the slope of the line between each set of ordered pairs. Then, determine which pairs of lines are parallel, perpendicular, or neither. (Finding Slope Given Two Points) (Slopes of Parallel and Perpendicular Lines)**

A. (3, 4) and (1, 6)

B. (2, 0) and (-3, 5)

C. (1, 5) and (-4, -5)

D. (-1, -9) and (2, -3)

E. (-6, 7) and (-3, 6)

F. (-1, -9) and (1, -3)

**#30-32: Find the slope and y-intercept of the graph of each linear function. Then, graph the line. (Graphing Linear Functions)**

30.  $y = \frac{1}{2}x + 10$

31.  $y = -4x - 3$

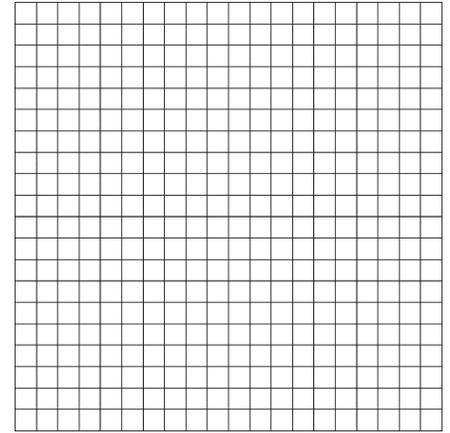
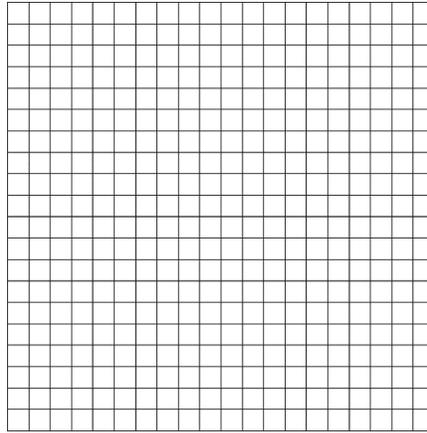
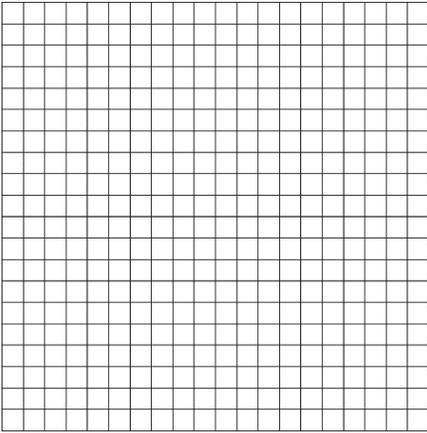
32.  $5x - y = 12$

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

Slope: \_\_\_\_\_

Slope: \_\_\_\_\_

Slope: \_\_\_\_\_ Intercept: \_\_\_\_\_



\_\_\_\_\_

Intercept: \_\_\_\_\_

Intercept: \_\_\_\_\_

**#33-35: Solve each system of equations using substitution. (Solving Linear Systems by Substitution)**

33.  $x+y=7$   
 $x=y+9$

34.  $y=2x+32$   
 $2x+y=60$

35.  $x+y=3$   
 $2x+2y=-4$

**#36-38: Solve the following systems of equations by elimination. (Solving Linear Systems by Elimination)**

36.  $8x-2y=8$   
 $x+2y=3$

37.  $3y-8x=9$   
 $y-x=2$

38.  $x+2y=-1$   
 $2x+4y=-2$

**#39-46: Factor each expression completely. (Factoring Expressions)**

39.  $r^2 - 12r + 32$

40.  $r^2 + 19r + 90$

41.  $10x^3 + 35x^2 - 150x$

42.  $30x^2 + 48x - 24$

43.  $n^2 - 9$

44.  $4v^2 - 1$

45.  $8x^3 - 32$

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**#46-48: Simplify each radical expression. (Simplifying Radicals)**

46.  $\sqrt{98}$

47.  $\sqrt{75}$

48.  $-5\sqrt{32}$

**#49-50: Find each product. (Multiplying Binomials)**

49.  $(x - 4)(x + 3)$

50.  $(3x - 2)^2$