Name:

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Robbinsville School District
Algebra 1 Summer Assignment

DUE THE FIRST DAY OF SCHOOL

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Welcome to Algebra 1! On the following pages you will find your summer assignment for the upcoming 2020-2021 school year. The summer assignment reviews pre-algebra and middle school math skills that you have learned in previous courses.

Algebra 1 teaches students to think, reason and communicate mathematically. Students use variables to determine solutions to real world problems. Skills gained in Algebra 1 provide students with a foundation for subsequent math courses. Students use a graphing calculator as an integral tool in analyzing data and modeling functions to represent real world applications. **Each student is expected to have a graphing calculator in class every day.** Students are expected to use calculators in class, on homework, during tests, during final exam and during NJSLAM testing. Robbinsville High School recommends a [TI84+](#) graphing calculator.

In May, all Algebra 1 students will be required to take and pass the Algebra 1 New Jersey Student Learning Assessment in Math (NJSLAM) as a graduation requirement.

Expectations for the Summer Packet:
The problems in this packet are designed to help you review **preskills** that are important to your success in Algebra 1. All work must be shown for each problem. The problems should be done correctly, not just attempted.

The packet is due on the first day of school. During the first week of school, concepts in the packet will be reviewed.

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All work should be completed and ready to turn in on the first day of school.

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Fractions: http://www.showme.com/sh/?h=NCF0t3w
Order of Operations: https://goo.gl/qO2VUK
Evaluating Expressions: http://www.showme.com/sh/?h=w3kFme8
Rounding: http://www.showme.com/sh/?h=w8Jkn44
Factors: https://goo.gl/DZnjcS
Graphing: http://www.showme.com/sh/?h=iBHI0WW
Slope Formula:
https://www.educreations.com/lesson/view/unit-6-the-slope-formula/54558839/?s=BMwGcS&ref=app
Writing in Slope-Intercept form:
https://www.educreations.com/lesson/view/writing-equations-in-slope-intercept-form/55218977/?ref=app
Graphing in Slope-Intercept form: https://www.educreations.com/lesson/view/graphing-using-slope-intercept-form/55219558/?s=VlcoEr&ref=app
Solving Equations: http://www.showme.com/sh/?h=ujv9Ck4
Word Problems: https://www.youtube.com/watch?v=DfbQjiSooOo

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Table of Contents

Operations with Fractions
Adding and Subtracting Fractions

Simplify. **DO NOT USE A CALCULATOR FOR THIS SECTION. Show all steps (common denominators).**

1. $\left(-\dfrac{3}{5}\right)+\dfrac{7}{4}$	**2.** $\left(-\dfrac{12}{7}\right)-\left(-\dfrac{11}{7}\right)$
3. $\left(-\dfrac{2}{7}\right)+\left(-\dfrac{1}{8}\right)$	**4.** $4-\left(-\dfrac{15}{8}\right)$
5. $\left(-\dfrac{1}{2}\right)-\dfrac{2}{3}$	**6.** $1+\left(-\dfrac{1}{3}\right)$

Multiplying and Dividing Fractions

Simplify. **DO NOT USE A CALCULATOR FOR THIS SECTION. Show all steps (common denominators).**

1. $\left(-\dfrac{3}{5}\right)\left(\dfrac{1}{2}\right)$	**2.** $\left(\dfrac{1}{9}\right)\left(-\dfrac{3}{4}\right)$
3. $\left(-\dfrac{2}{5}\right)\left(\dfrac{3}{2}\right)$	**4.** $-2\left(-\dfrac{1}{5}\right)$

5. $\dfrac{13}{8} \div \dfrac{-11}{6}$	**6.** $-2 \div \dfrac{3}{2}$
7. $\dfrac{1}{5} \div 5$	**8.** $\dfrac{-4}{9} \div \dfrac{-7}{9}$

Order of Operations

To avoid having different results for the same problem, mathematicians have agreed on an order of operation when simplifying expressions that contain multiple operations.

1. Perform any operation(s) inside grouping symbols (parentheses, brackets, above or below a fraction bar)
2. Simplify any terms with exponents or roots from left to right
3. Multiply or divide from left to right
4. Add or subtract from left to right

Simplify using order of operations.

1. $12 \cdot 5 + 6 \div 6$	**2.** $10\left(3 - 6^2\right) + 8 \div 2$
3. $\dfrac{5 + \left[30 - (8-1)^2\right]}{11 - 2^2}$	**4.** $5\left(14 - 39 \div 3\right) + 4\left(\dfrac{1}{4}\right)$
5. $\dfrac{3\left[10 - (27 \div 9)\right]}{4 - 7}$	**6.** $\dfrac{1}{4}(3 \cdot 8) + 2(-12)$

Evaluating Expressions

1. *Evaluate each expression if* $a = 3$, $b = \dfrac{1}{2}$, $c = 5$, $d = 1$, $e = -10$, *and* $f = -12$.

$e \div c$	$\dfrac{f}{c-d}$	$a \div b$	d^4
$\dfrac{bce}{a+b}$	$e^3 - 9e^2$	$3b - 5a$	$\dfrac{a}{c} + \dfrac{d}{e}$

2. *Evaluate each expression if* $a = 2$, $b = 4$, $c = 1$, $d = 5$, $e = 10$.

$\sqrt{e+d+c}$	$d^a + c^e$	$\dfrac{\sqrt{8e+1}}{b^2+3}$
$\sqrt{98 + \sqrt{b}}$	b^b	$3b + \sqrt{b+d}$

Rounding Numbers

Round each number to the tenths, hundredths, and thousandths place.

	TENTHS	HUNDREDTHS	THOUSANDTHS
36.9913			
17.1083			
15.9199			
0.6701			
34.9127			
18.9763			

Perfect Squares

List the first 20 perfect squares and their square roots.

$1 * 1 = 1$	$\sqrt{1} = 1$		
$2 * 2 = 4$	$\sqrt{4} = 2$		

Finding the Factors of a Number
Find all the factors of each number, including 1 and itself.

24	36	72	-12
8	-6	5	15
45	27	34	51

Graphing

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

Quadrant 2	Quadrant 1
(-x , y)	(x , y)
(-x , -y)	(x , -y)
Quadrant 3	Quadrant 4
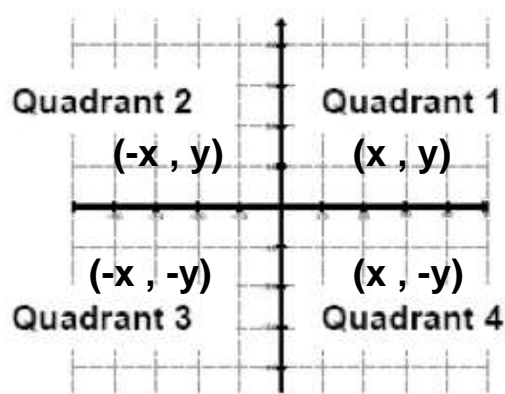
Plot each function on the graph using the table of values.

$y = -\frac{2}{3}x + 8$

X	Y
-6	
-3	
0	
3	
6	
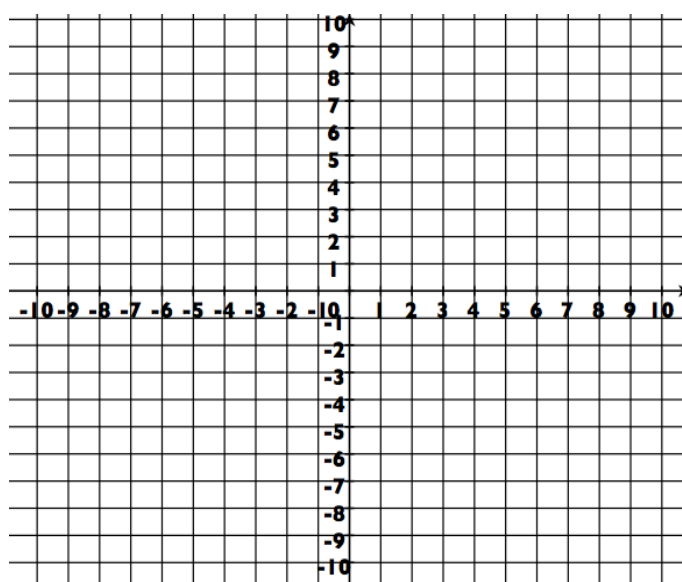
$y = \frac{1}{2}x - 3$

X	Y
-4	
-2	
0	
2	
4	
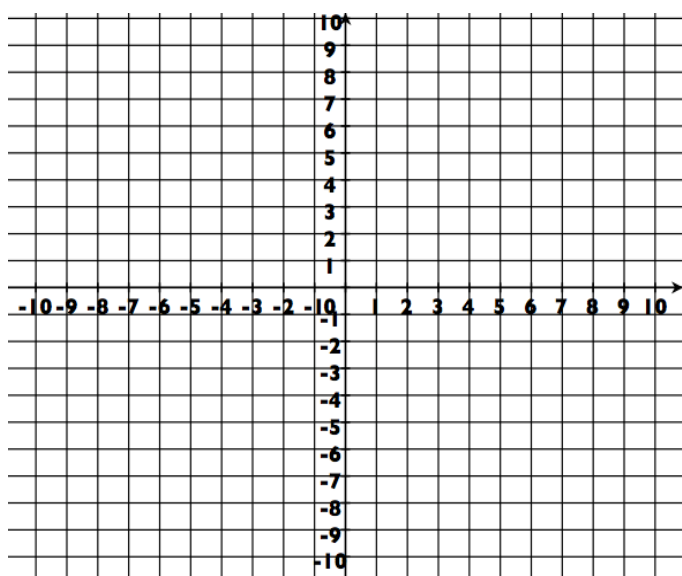
$y = 2x - 5$

X	Y
0	
1	
2	
3	
4	
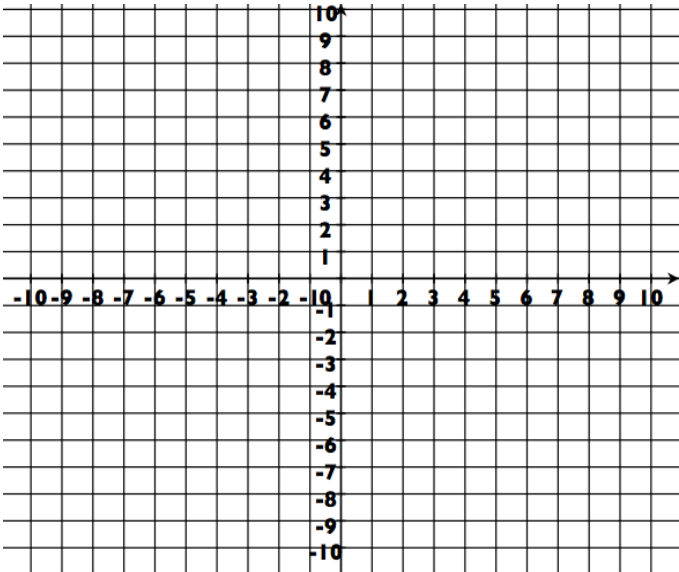
$y = x + \frac{1}{2}$

X	Y
-4	
-2	
0	
2	
4	
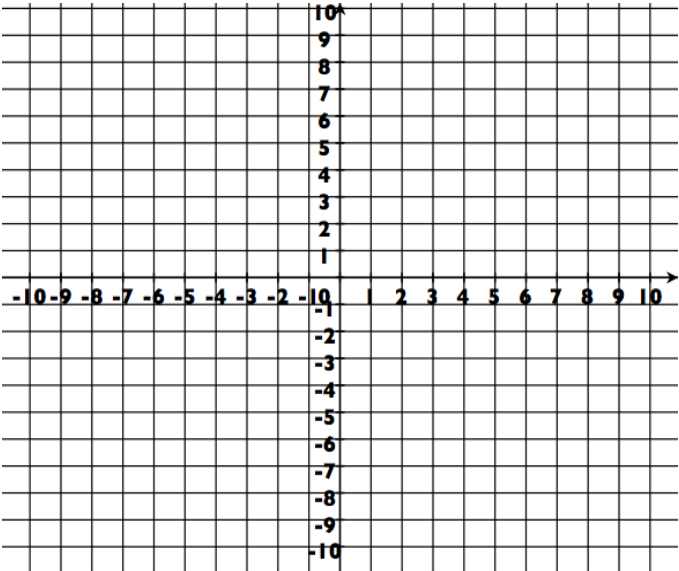
Slope and Slope-Intercept Form

Formulas learned last year:

Slope Formula when given two points: $\dfrac{rise}{run} = \dfrac{y_2 - y_1}{x_2 - x_1}$

Slope-Intercept Form: $y = mx + b$ (m is the slope, b is the y-intercept)

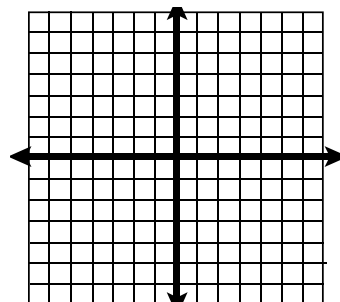**Plot the two points on the graph. Then find the slope of the line that goes between them.**
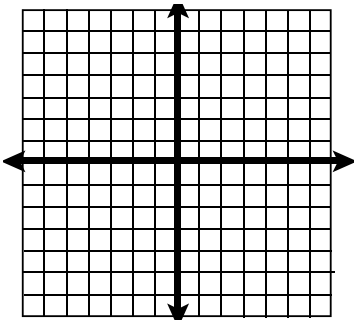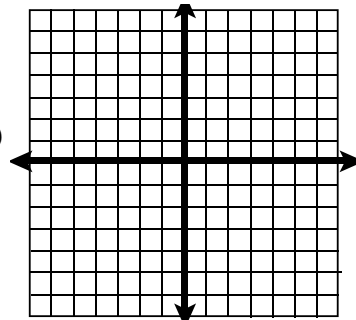
1)

(–3, –2) and (1, 6)
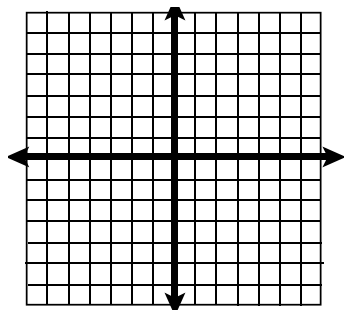
2)

(0, –6) and (4, 0)

3)

(2, 4) and (4, – 4)

4)

(–6, –1) and (–6, 4)

Use the slope formula to find the slope of the line.

5) (3, 4) and (–2, 6)
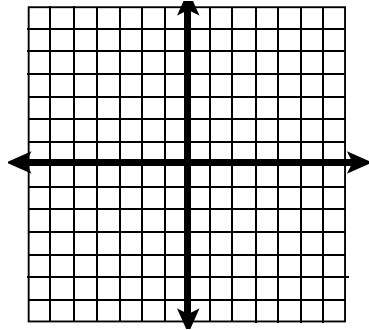
6) (6, –7) and (4, 3)

7) (–7, 4) and (–1, 4)

Write the equation in slope-intercept form. Identify the slope and y-intercept.
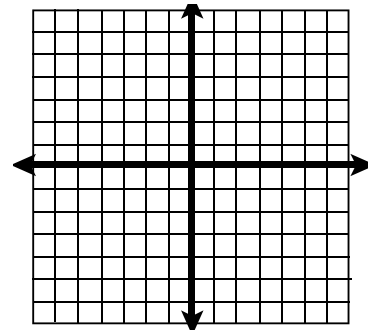
8) $6x + 3y = 12$

9) $8x - 2y = 6$

Graph the equations using slope-intercept form. Clearly identify the slope and y-intercept in every problem.
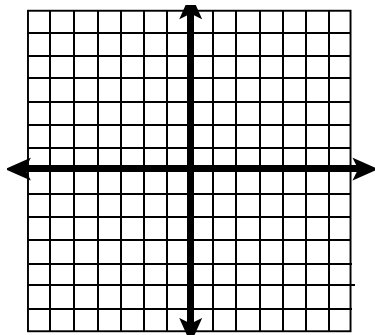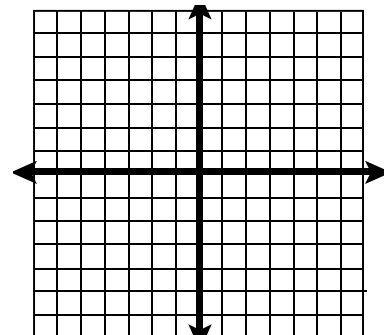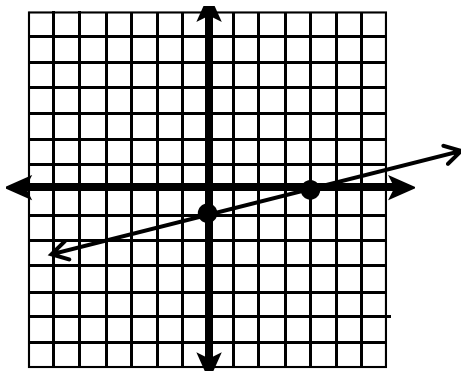
10) $y = 2x - 5$

11) $y - 4 = 0$

12) $3y + 2x = -6$

13) $5x - 4y = 8$

Write the slope-intercept form of the equation of each line.

14. Equation: _____

15. Equation: _____
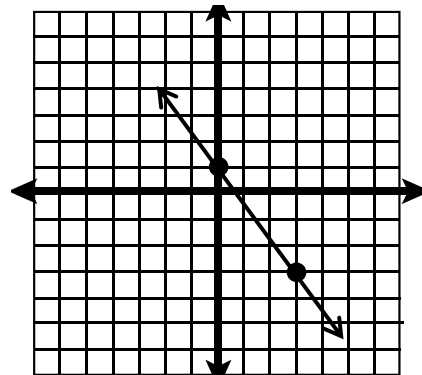
Solving Equations

Solve each equation for the unknown variable.

1. $2m - 4 = 7$	2. $-2(s - 3) = -1$	3. $\frac{1}{2}x + 6 = 18$
4. $5n = 20(4 + 0.25n)$	5. $8t + 7 + 6t = -33 + 4t$	6. $6(b - 2) = -3(4 - 2b)$
7. $10.4 = n + 3(n - 2)$	8. $\frac{1}{3} + \frac{4w}{6} = \frac{2}{3}$	9. $\frac{1}{3}x + 3 = \frac{2}{3}x - 5$

Word Problems

Key Words for Translations:

ADD	SUBTRACT	MULTIPLY	DIVIDE	INEQUALITIES	VARIABLE	=
Plus	Decreased	Per	One-third	< is less than	A number	Same as
Sum	Smaller	For every	Quotient	> is greater	Some	Equals
Longer than	Less than	For each	Divided by	than	number	Is
Greater	Difference	Triple	Each part	£ is less than	Quantity	Total
than	Reduced	Multiplied	Half as	or equal to		Was
Together	Differ	Of	much	3 is greater		Result
Total	Fewer	Times	Split	than or equal to		Outcome
Increased	Shorter than	Twice	equally			Answer
More than	Minus	Double				
In all	Diminished					
Add						

Translate each word problem into algebraic equation, using x for the unknown, and solve.

Steps:

Step 1: Write a "let x =" statement for each unknown.

Step 2: Write an equation or inequality to model the situation.

Step 3: Solve the equation or inequality.

Step 4: Substitute the value for x into the "let x=" statement(s) to answer the question.

Solve each word problem using the methodology stated above.

1. A video store charges a one-time membership fee of $12.00 plus $1.50 per video rental. How many videos can Sarah rent if she spends $21?

2. Bicycle City makes custom bicycles. They charge $160 plus $80 for each day that it takes to build the bike. If you have $480 to spend on your new bicycle, how many days can it take Bicycle City to build your bike?

3. Jen weighs 20 pounds more than Anna. If the sum of their weights is 250 pounds, how much does each girl weigh?

4. Sam drove 3 hours more than Michael on their trip to Texas. If the trip took 37 hours, how long did Sam and Michael each drive?

5. Twice a number decreased by 15 is equal to -27. What is the number?

6. Three less than the sum of four times a number and six is eight. Find the number.

7. Four more than half of a number is at least nine. What is the number?