Quarter 2 Review Packet Name:_____

Current Grade:_____ Mastery Level:_____ Date:_____ Algebra:_____

Quarter 2 Review

- ***Unit 6: Exponents and Radicals***
  - *Topic 1: Exponent Laws*
    - *Learning Target 1: Simplify an exponential expression using the 5 exponent laws*

1) $2yx^3 \cdot (2x^2y^{-4})^3$

2) $\dfrac{(2x^4y^3)^2}{(yx^{-4})^4}$

3) $\dfrac{3x^2y^{-3}}{2x^3y^{-2} \cdot 3x^{-4}y^{-4}}$

4) $\dfrac{(2x^{-3}y^{-2})^2}{x^0y^{-4} \cdot -2xy^3}$

  - *Topic 2: Exponential Growth and Decay*
    - *Learning Target 1: Use the growth/decay formula to solve problems.*

1. The bacteria count increases exponentially at a rate of 11.5% an hour. If a piece of candy has 9 bacteria on it now, how many where there be in:
   a. 12 hours?

   b. 2 days?

2. The value of a boat depreciates at a rate of 8% a year. If the boat was originally worth $18,500, how much will it be worth in:

   a. 3 years?

   b. A decade?

- *Topic 3: Radicals*
  - *Learning Target 1: Simplify radicals with and without variables. Add, subtract, multiply, divide, and rationalize radicals.*

1) $-\sqrt{192x^4}$	2) $3\sqrt{12}-2\sqrt{27}$
3) $\sqrt{15}(2+\sqrt{5})$	4) $\dfrac{\sqrt{8}}{\sqrt{10}}$

- ***Unit 5: Systems Part 1***
  - *Topic 1: Solving Systems of Equations*
    - *Learning Target 1: solve a system of equations using substitution*

Solve each system by substitution.

1) $y=-4x+8$
$6x+3y=6$

2) $2x-y=0$
$y=2x-2$

3) $4x-y=4$
$x-5y=1$

4) $-x-2y=-3$
$y=5$

- *Learning Target 2: solve a system of equations using elimination*

Solve each system by elimination.

5) $5x + 6y = -1$
$-5x + 10y = -15$

6) $-3x - y = -1$
$-3x - y = -1$

7) $2x + 4y = 20$
$-2x - 2y = -10$

8) $-4x - 5y = -21$
$8x - 5y = 27$

- *Learning Target 3: decide which method of solving is more appropriate*

Look at each of the following systems and identify the best method of solving. Why did you choose that method?

9) $-2x + 4y = 14$
$x - y = -3$

10) $y = 7x + 15$
$7x - 2y = -9$

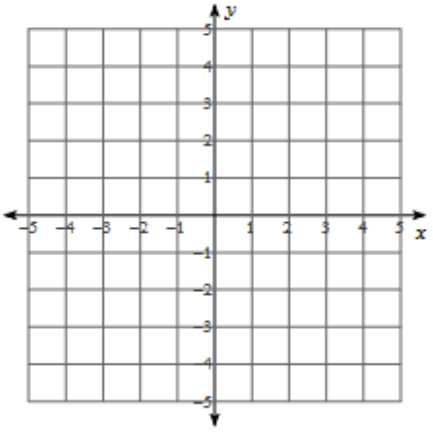
11) $4x - 6y = -30$
$-3x + 6y = 21$

12) $-5x + 2y = -22$
$-5x + 4y = -4$

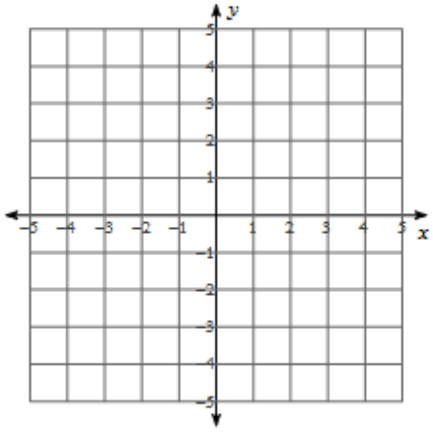
- *2: Graph Linear Systems*
  - *Learning Target 1: Graph a system of equations and identify the solution*

Graph each system of equations. Label both lines. STATE AND LABEL the solution.

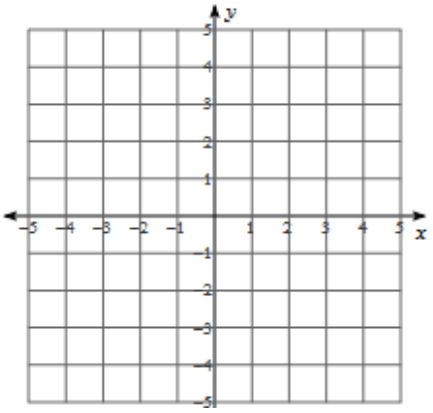
15) $x - 3y = 6$
$x + 3y = -12$



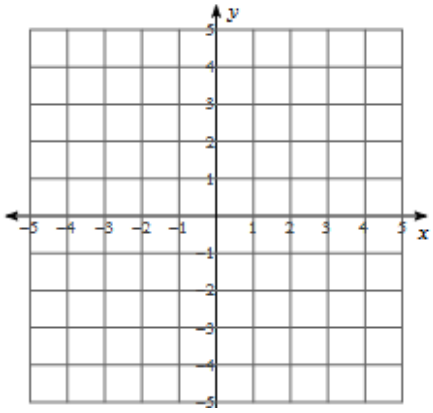
16) $x - 4y = -8$
$5x - 4y = 8$



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



18) $0 = 24 - 3x + 12y$
$4y = 4 + x$



- *Learning Target 3: Find the solution of a linear system using a graphing calculator*

Solve the following systems by plugging the equations into your calculator.

19) $y = -3x - 5$
$y = 6x + 4$

20) $y = 5x + 9$
$y = 2x$

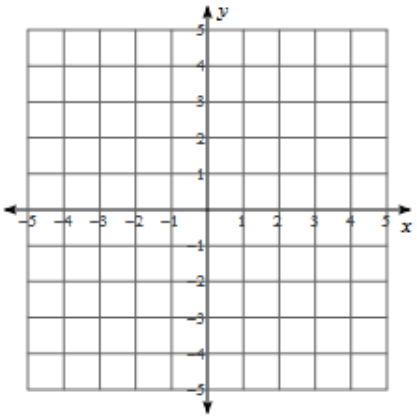
21) $y = -8x + 12$
$4x + 7y = -20$

22) $-5x + y = 9$
$-6x + 3y = 0$

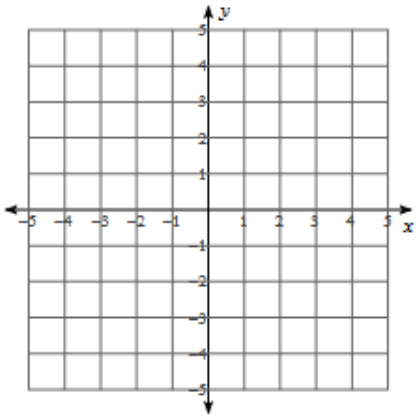
- *Learning target 4: graph a system of linear inequalities and identify the solution*

Sketch the solution to each system of inequalities.

23) $y \leq -1$
$y < -4x + 3$



24) $y > -x + 2$
$y \leq 2x - 1$



- *Topic 3: Modeling with Systems*
  - *Learning Target 1: create a model of linear equations that models a given situation*

Write a system of equations that fits the given situation. Define two variables, write two equations, solve your system of equations, and answer the question in a full sentence.

25) Gabriella's school is selling tickets to a choral performance. On the first day of ticket sales, the school sold 3 adult tickets and 2 student tickets for a total of $42. The school collected $114 the second day by selling 9 adult tickets and 2 student tickets. What is the price of one adult ticket and the price of one student ticket?

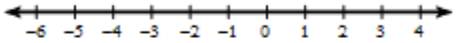
26) Find the value of 2 numbers if their sum is 21 and their difference is 3.

27) Going down a river, a boat went 20 km/h. Going up the river, the boat went 2 km/h. What is the speed of the current? What is the speed of the boat without the current?

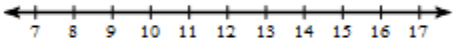
28) Jose and Kristin are selling pies for a school fundraiser. Customers can buy cherry pies and pumpkin pies. Jose sold 10 cherry pies and 9 pumpkin pies for a total of $140. Kristin sold 6 cherry pies and 1 pumpkin pie for a total of $40. Find the cost of one cherry pie. Find the cost of one pumpkin pie.

- ***Unit 4: Inequalities***
  - *Topic 1: 1 Variable Inequalities*
    - *Learning Target 1: Solve and graph one variable inequalities*

1) $3(4-3r) \le 48$

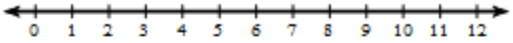


2) $\frac{-2+x}{2} > 4$

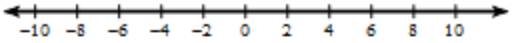


- *Learning Target 2: Solve and graph one variable compound inequalities*

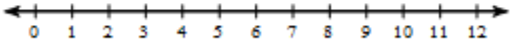
1) $5-2p > -7$ and $3p-9 > 0$



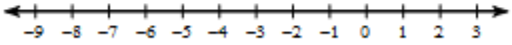
2) $5k-6 > 24$ or $-3k-7 \ge 8$



3) $0 \le x-2 < 4$

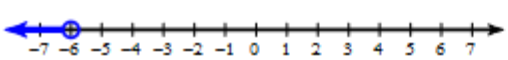


4) $-70 < 10n-10 \le 0$

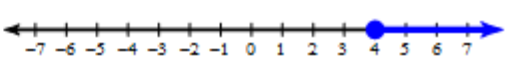


- *Learning Target 3: Write the equation of a one variable inequality given its graph.*

1)

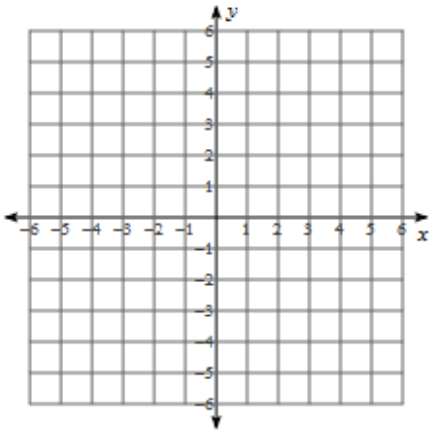


2)

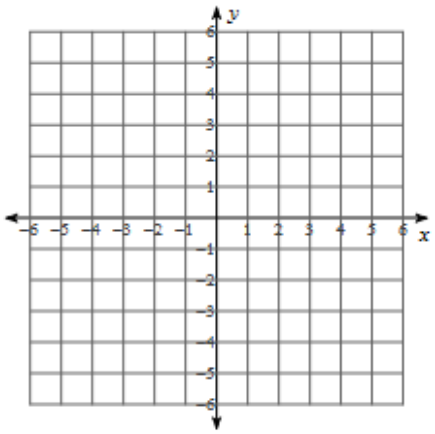


- *Topic 2: 2 Variable Inequalities*
  - *Learning Target 1: Graph a two variable inequality given the equation of the inequality in any form.*

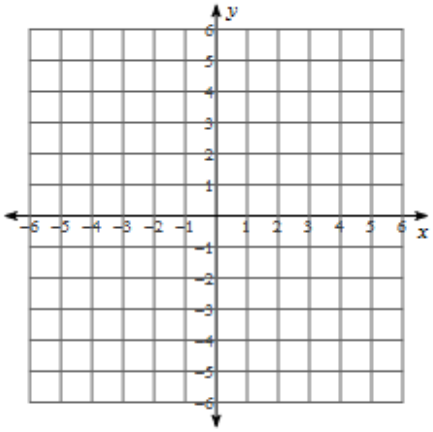
1) $y \geq \frac{7}{3}x + 2$



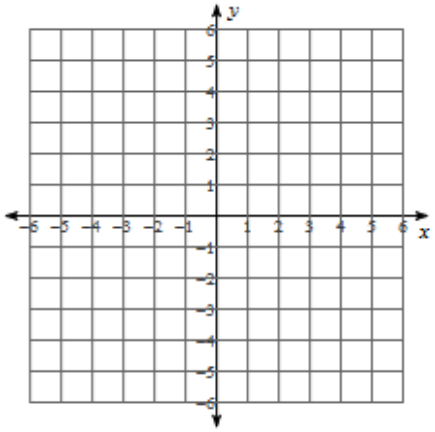
2) $y < 1$



3) $2x + y < 3$

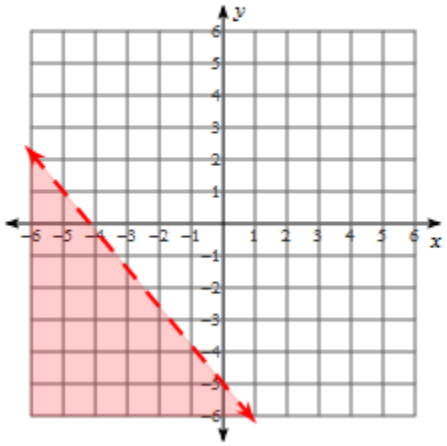


4) $x - 3y \geq -3$

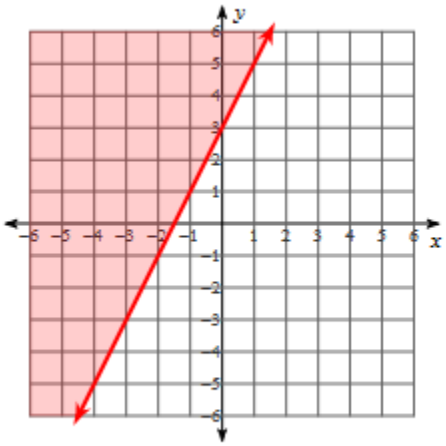


- *Learning Target 2: Write the equation of a two variable inequality given its graph*

1)



2)



- *Topic 3: Modeling Inequalities*
  - *Learning Target 1: Write an inequality that models a realistic situation.*

1. Tommy is saving up to buy a new car. He already has $600 saved up and is working afterschool to earn extra money. He gets paid $14 an hour and needs $3500 for the car. How many hours does he need to work to have enough to buy the car?

a. Write an ***inequality*** that describes this situation. Be sure to define your variables

b. Solve your ***inequality*** to answer the question. Be sure your answer is in sentence form.

2. Sally is going on a shopping spree and has a $250 budget. She already spent $98 on a new dress and $34 on a pair of jeans. She also wants to buy a few shirts that cost $28 each. What is the maximum number of shirts she can buy and still be in her budget.

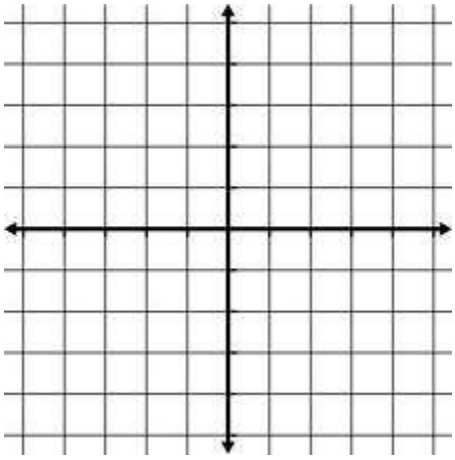
a. Write an ***inequality*** that describes this situation. Be sure to define your variables

b. Solve your ***inequality*** to answer the question. Be sure your answer is in sentence form.

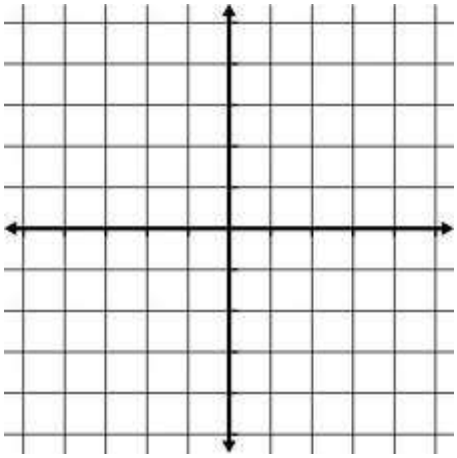
- ***Unit 3: Graphing Lines***
  - *Topic 1: Graphing Lines:*

    - *Learning Target 1: Graph a line given two points on the line:*

a. The points (-4,1) and (0,-2) are on a line.
Plot the line:

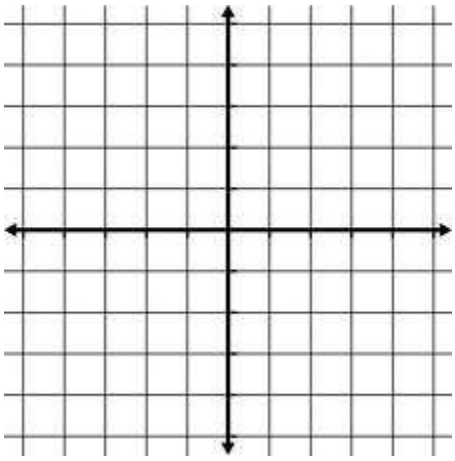


b. The points (5,-3) and (-2,-3) are a line.
plot the line:

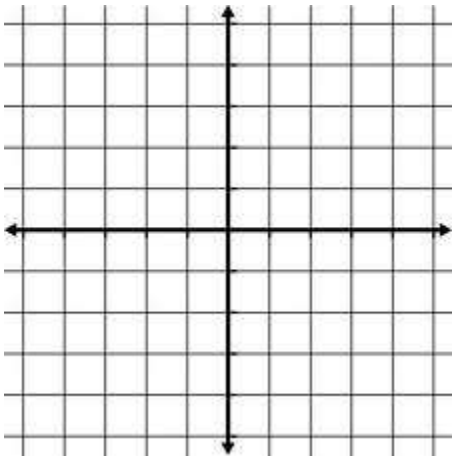


    - *Learning Target 2: Graph a line given one point and the slope of the line.*

a. A line has m = -2 and the point (-3,2) is on the line
Plot the line:

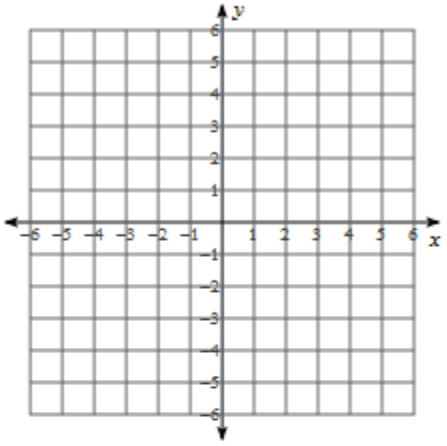


b. A line has m = 2/3 and the point (-4,0) is on the line
plot the line:

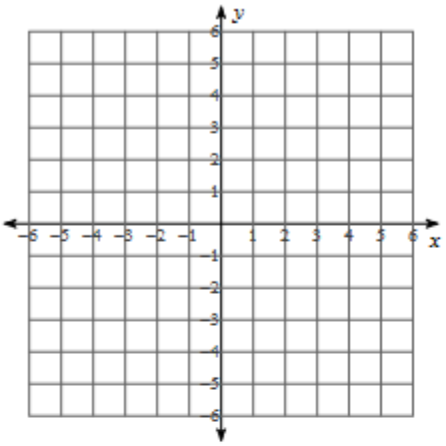


- *Learning Target 3: Graph a line given the equation of the line in slope –intercept form.*

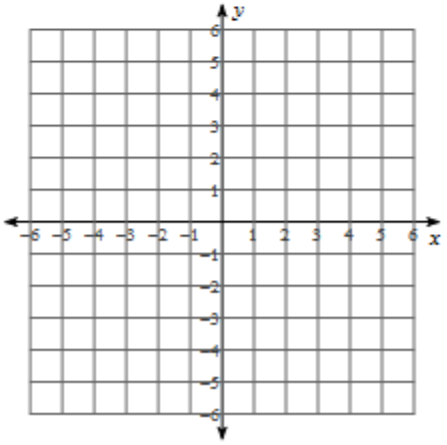
1) $y = \frac{1}{4}x + 1$



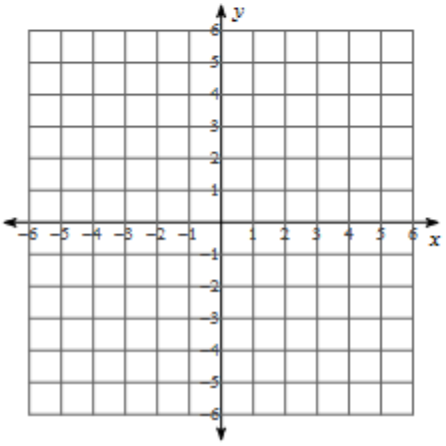
2) $x = 2$



3) $y = -x + 3$

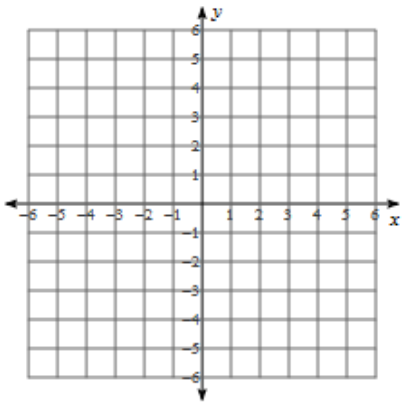


4) $y = \frac{1}{3}x$

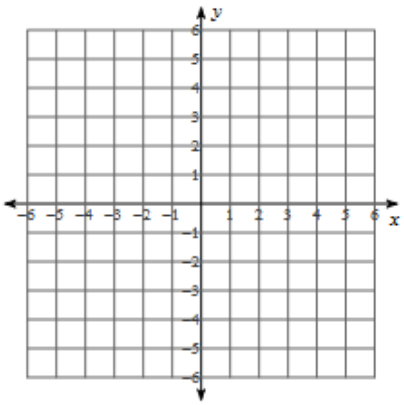


- *Learning Target 4: Graph a line given the equation not in slope intercept form.*

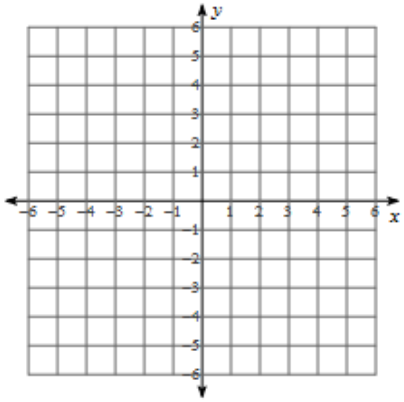
1) $-8x = -20 + 5y$



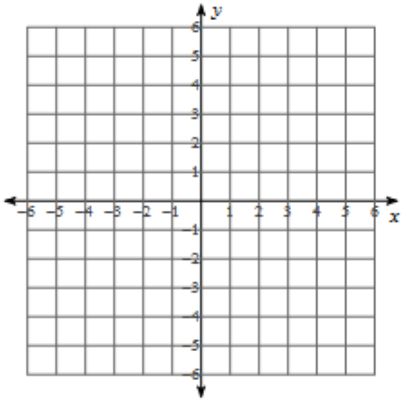
2) $-y = -x - 1$



3) $6x - 5y = 15$

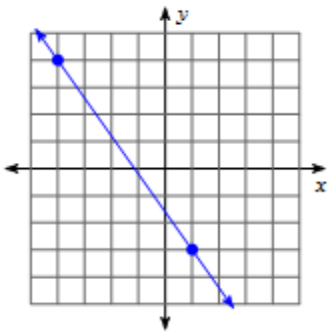


4) $-9 - 3y = 0$

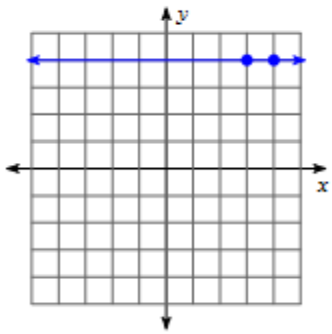


- *Learning Target 5: Find the slope of the line given the graph of the line.*

1)



2)



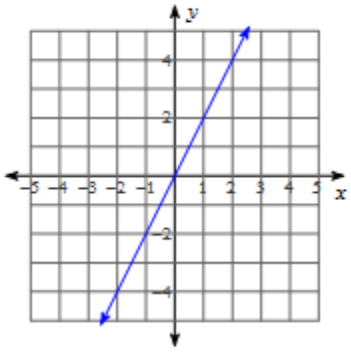
- *Learning Target 6: Find the slope of the line given two points.*

1) $(-5, 9), (-15, 11)$

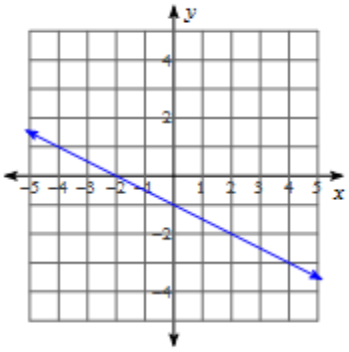
2) $(15, -10), (15, -4)$

- *Topic 2: Writing the equations of Lines:*
  - *Learning Target 1: Write the equation of the line given its graph.*

1)



2)



- *Learning Target 2: Write the equation of the line give one point and the slope of the line.*

1) through: $(1, -5)$, slope $= -7$

2) through: $(3, -2)$, slope $= -\frac{1}{2}$

- *Learning Target 3: Write the equation of the line give two points on the line.*

1) through: $(1, 0)$ and $(2, 3)$

2) through: $(-2, 3)$ and $(0, 2)$

- ***Unit 2: Solving Equations***
  - *Topic 6: Solving Equations:*
    - *Learning Target 1: Be able to solve any equation of one variable*
      - *Combining like terms*
      - *Variables on both sides of the equals sign*
      - *Cross multiplication*
      - *Distribution*
      - *Equations with fractions*

<u>See solving equations practice sheet at the end of the packet for problems</u>

- *Learning Target 2: Solve a literal equation for a given variable.*

a. the formula for the perimeter of a rectangle is $P = 2l+2w$. Solve the formula for *w.*

b . Consider the equation $\frac{2a+b}{5} = c + 1$ Solve the equation for *a.*

  - *Topic 7: Modeling Equations:*
    - *Learning Target 1: Write and solve an equation that models a realistic situation.*

Which equation could be used to solve: 3 less than 5 times a number is 22?

[A] $\frac{22}{5}n = 3$ [B] $5n - 3 = 22$

[C] $3 - 5n = 22$ [D] $5n = 3 - 22$

Use an equation to model the sentence.
How many raisins are left in a jar of 37 raisins after you have eaten some?

[A] $R = 37 + N$ [B] $R = \frac{N}{37}$

[C] $R = \frac{37}{N}$ [D] $R = 37 - N$

The fare for riding in a taxi is a $1 fixed charge and $0.40 per mile. The fare for a ride of d miles is $11.20. Which equation could be used to find d?

[A] $1(11.20 + d) = 1$

[B] $1 + 0.40d = 11.20$

[C] $0.40 + 1d = 11.20$

[D] $(0.40 + 11.20)d = 1$

Anita was selling Girl Scout cookies for the local Girl Scout Troop. Each box of cookies cost $2.95. Mrs. Brown's purchase of Girl Scout cookies totaled $14.75. Choose the equation to determine how many boxes of Girl Scout cookies were purchased by Mrs. Brown.

[A] $2.95 = 14.75(c)$ [B] $2.95(c) = 14.95$

[C] $2.95(14.75) = c$ [D] $2.95 + c = 14.95$

- *Topic 8: Properties:*
  - *Learning Target 1: Identify and use the properties of real numbers using integers and variables.*

1 Which property is illustrated by the equation $ax + ay = a(x + y)$?
1) associative
2) commutative
3) distributive
4) identity

5 Which property of real numbers is illustrated by the equation $52 + (27 + 36) = (52 + 27) + 36$?
1) commutative property
2) associative property
3) distributive property
4) identity property of addition

2 The statement $2 + 0 = 2$ is an example of the use of which property of real numbers?
1) associative
2) additive identity
3) additive inverse
4) distributive

6 The equation ❋(Δ + ❤) = ❋Δ + ❋❤ is an example of the
1) associative law
2) commutative law
3) distributive law
4) transitive law

- ***Unit 1: Beat the Basics***
  - *Topic 1: Signed Numbers and Order of Operations*
    - *Learning Target 1: Be able to perform mathematical operations with positive and negative numbers.*

Evaluate each expression.

33) $8 + -8$

34) $-6 - -4 - 6$

35) $-2 - 1 + -3 + -2$

36) $-2 \cdot 10$

37) $3 \cdot -5 \cdot -5 \cdot -10$

38) $\frac{-54}{6}$

- *Learning Target 2: Be able to simplify multistep expressions using order of operations*

Evaluate each expression.

39) $2 - -4 - (-5 + 5)$

40) $6 - (6 + 3) - (-2 - -1)$

41) $4^2 \cdot 4 \div ((5 - 3) \cdot -2)$

42) $-10 \div (2^2 - 6) \cdot -4 \div (6 - 4)$

- *Topic 2: Fractions*
  - *Learning Target 1: simplify improper fractions*

Simplify each. Leave your answer as an improper fraction.

1) $\frac{16}{10}$

2) $\frac{6}{4}$

3) $\frac{42}{24}$

4) $\frac{18}{12}$

  - *Learning Target 2: perform all mathematical operations with fractions*

Evaluate each expression.

5) $\frac{4}{5} - -\frac{3}{2}$

6) $-\frac{1}{2} - \frac{3}{5}$

7) $1 + -\frac{4}{3}$

8) $-\frac{3}{4} - \frac{9}{7}$

9) $-\frac{2}{3} \cdot \frac{16}{9}$

10) $\frac{7}{4} \cdot -\frac{3}{2}$

11) $\frac{11}{8} \div -2$

12) $\frac{3}{4} \div \frac{-4}{3}$

- *Learning Target 3: complete problem solving that involves fractions.*

13) A large pizza has 12 slices in it. If Tom at 1/4 of the pizza, Jim at 1/6 of the pizza and John ate 1 slice, how many slices are left?

14) Mrs. Mills made a batch of 24 cookies. She sent 3/4 of the cookies to school for her daughter's class and gave 1/8 of the cookies to her husband. How many cookies are left for Mrs. Mills?

○ *Topic 3: Decimals and Percents*

- *Learning Target 1: perform mathematical operations with decimals*
- *Learning Target 2: convert decimals to percents and visa versa*

Write each as a decimal. Round to the hundredths place.

15) 36%

16) 77%

17) 70%

18) 41%

Write each as a percent. Round to the nearest percent.

19) $\frac{1}{2}$

20) $\frac{57}{80}$

21) $\frac{11}{14}$

22) $\frac{3}{10}$

Solve each problem.

23) 64% of 32 is what?

24) What is 70% of 72?

25) 104 is what percent of 55.9?

26) What is 56% of 27?

27) What is 49% of 100.9?

28) What percent of 118 is 5?

- *Learning Target 3: complete problem solving that involves decimals and percents*

Find the selling price of each item.

29) Original price of a calendar: $13.00
Tax: 3%

30) Original price of a computer game: $43.50
Tax: 4%

31) Original price of an SUV: $58,000.00
Discount: 40%
Tax: 1%

32) Original price of a comic book: $3.00
Discount: 20%
Tax: 6%

33) Original price of shorts: $31.95
Discount: 50%
Tax: 3%

34) Original price of a CD: $19.50
Discount: 43%
Tax: 1%

SOLVING EQUATIONS:

1) $\frac{x}{3} + 1 = 6$

2) $90 = -5(-4 + r)$

3) $-1 = \frac{7 + x}{8}$

4) $\frac{b}{20} - 5 = -4$

5) $\frac{8}{10} = \frac{n}{n - 5}$

6) $\frac{b + 9}{3} = \frac{b}{6}$

7) $\frac{5}{4} = \frac{x - 1}{x + 1}$

8) $\frac{6}{v - 6} = \frac{9}{v + 3}$

9) $2 - 5n + 6 = -7$

10) $8a - 2 = 7a - 8$

11) $7 + 5k = 7 + 6(k + 1)$

12) $2 - 2(7p + 4) = -4(p + 4)$

13) $\frac{8}{5} = \frac{8}{5} + \frac{5}{3}n$

14) $\frac{1}{3}x - \frac{3}{2} = -\frac{7}{6}$

15) $\frac{7}{3} + \frac{4}{3}b = \frac{8}{3}b + 1$

16) $-\frac{7}{2}v + \frac{17}{6} = \frac{5}{2}v + \frac{4}{3}$