

Name \_\_\_\_\_

Gillespie

Course 3: Semester Exam Review

Directions: When working each of the following questions, be sure to show all work.

**UNIT 1**

- 1) The table shows the free-throw statistics for three basketball players. Which player had the greatest free-throw success rate?

Player	Free-Throw Success
James	67.5%
Carlos	22 out of 32
Thomas	$\frac{20}{27}$

c) Thomas

- 2) A camp counselor asked a group of campers to name their favorite activity. The counselor found that 20% of the campers chose canoeing, 5 out of 12 chose hiking, and  $\frac{23}{60}$  chose campfire building. Order the activities from least popular to most popular.

b) canoeing, campfire building, hiking

- 3) The closest distance from Venus to the Sun is about 46,000,000 kilometers. What is this number written in scientific notation?

a)  $4.6 \times 10^7$

- 4) Write 0.000022 in scientific notation.

c)  $2.2 \times 10^{-5}$

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- 5) Express the number below in standard decimal notation.

$$3.07 \times 10^{-4}$$

.000307

- 6) Express the number below in standard decimal notation.

$$3.201 \times 10^6$$

3,201,000

- 7) To the nearest whole number, what is the best estimate for  $\sqrt{456}$ ?

21

- 8) Estimate the number below to the nearest integer.

$$\sqrt{27\frac{3}{8}}$$

5

- 9) Identify the rational number(s) in number set below.

$$\sqrt{8}, 3.5, 0, \sqrt{25}, -4, \bar{3}, -\sqrt{121}$$

d)  $\sqrt{8}$

- 10) Order these numbers from least to greatest:  $\sqrt{63}$ , 8,  $7\frac{8}{9}$ ,  $7.\bar{9}$

a)  $\sqrt{63} < 8 < 7\frac{8}{9} < 7.\bar{9}$

b)  $7\frac{8}{9} < \sqrt{63} < 7.\bar{9} < 8$

c)  $7.\bar{9} < 7\frac{8}{9} < <$

d)  $7\frac{8}{9} < 7.\bar{9} < \sqrt{63} < 8$

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11) Express  $3.26 \times 10^{-4}$  in standard decimal notation form.

a) 0.000326

b) 0.00326

c) 326

d) 32,600

12) Express 0.00013 in scientific notation.

a)  $0.00013 \times 10^4$

b)  $0.13 \times 10^3$

c)  $1.3 \times 10^{-4}$

d)  $1.3 \times 10^4$

13) Write this number in scientific notation: 0.000562

a)  $0.562 \times 10^{-3}$

b)  $5.62 \times 10^{-4}$

c)  $562 \times 10^{-6}$

d)  $562 \times 10^6$

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14) Express all values in scientific notation  $\frac{(3030)+(0.0034)}{.00066}$

a) 
$$\frac{(3.03 \times 10^3) + (3.4 \times 10^{-3})}{6.6 \times 10^{-4}}$$

b) 
$$\frac{(3.03 \times 10^{-3}) + (3.4 \times 10^3)}{6.6 \times 10^4}$$

c) 
$$\frac{(3.030 \times 10^4) + (3.40 \times 10^{-3})}{6.06 \times 10^{-4}}$$

d) none of the above

15) Estimate to compare  $2\pi$  and  $\sqrt{17}$

a)  $2\pi < \sqrt{17}$

b)  $2\pi = \sqrt{17}$

c)  $2\pi > \sqrt{17}$

d) none of the above

16) Estimate  $\sqrt{463}$

a)  $\approx 20$

b)  $\approx 21$

c)  $\approx 22$

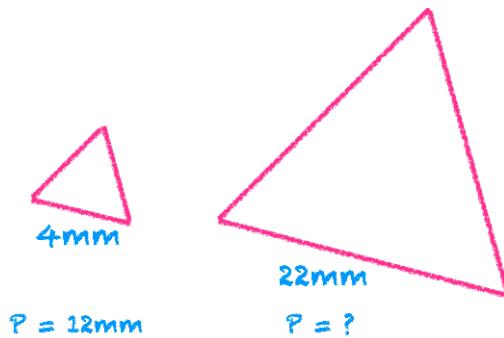
d)  $\approx 23$

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## UNIT 2

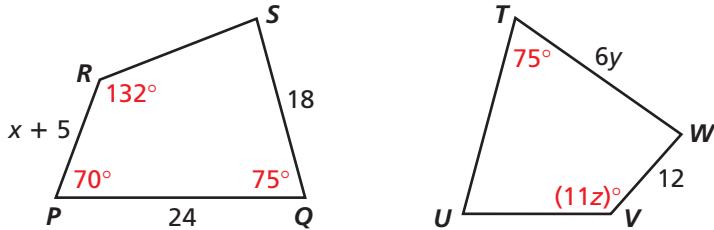
17) The two triangles are similar. Determine the perimeter of the second figure.

- a) 24 mm
- b) 36 mm
- c) 46 mm
- d) 66 mm



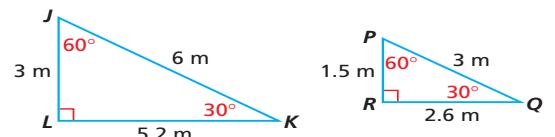
18) Quadrilateral  $QPRS \cong TUVW$ . Find  $z$

- a) 12
- b) 11
- c) 6.8
- d) 75



19) Determine whether the triangles are similar by angle-angle similarity.

- a) Yes; at least two angles are congruent
- b) Yes; all angles add up to  $180^\circ$
- c) No; at least two angles need to be congruent
- d) No; angle – angle similarity is fake



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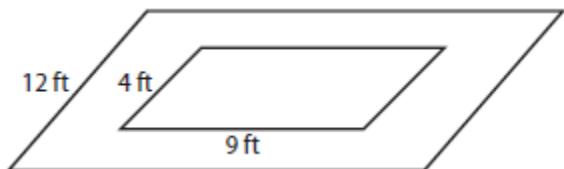
- 20)** Ella is creating a poster for her run as class president from a template she made on a piece of paper. The image she is reproducing is 5 inches by 7 inches. She enlarges the dimensions by a scale factor of 6. Describe the relationship between the areas of original image and the new image.

- a. The area of the new image is 6 times the area of the original image.
- b. The area of the new image is 12 times the area of the original image.
- c. **The area of the new image is 36 times the area of the original image.**
- d. The area of the new image is 72 times the area of the original image.

- 21)** An H-shaped figure is formed by three rectangles having areas of 500 square centimeters, 725 square centimeters, and 725 square centimeters. Caleb dilates the figure by a scale factor of  $\frac{3}{5}$ . What is the total area of the new H-shaped figure?

- a.  $1,170 \text{ cm}^2$
- b.  **$702 \text{ cm}^2$**
- c.  $870 \text{ cm}^2$
- d.  $1,950 \text{ cm}^2$

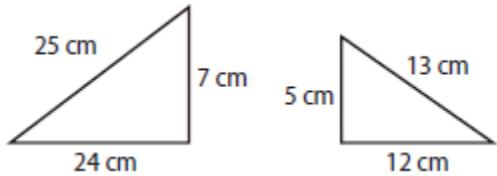
- 22)** Determine whether the polygons are similar



- a. similar
- b. not similar
- c. **not enough information to determine**
- d. none of these

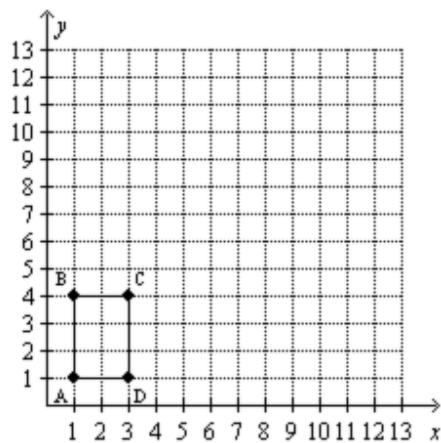
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23) Determine whether the polygons are similar



- a. similar
- b. not similar
- c. not enough information to determine
- d. none of these

24) Draw the image of the figure after a dilation with point A as the center by a scale factor of 2.5. What will be the coordinates of C'

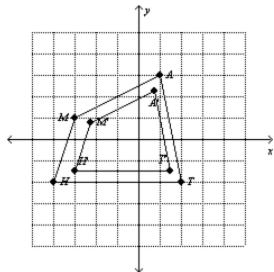


- a) (7.5, 10)
- b) (10, 7.5)
- c) (1.2, 1.6)
- d) (1.6, 1.2)

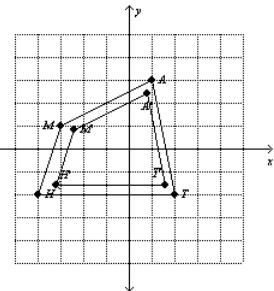
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- 25)** Determine the coordinates of the vertices of the figure after a dilation with the given scale factor  $k$ . Write an algebraic representation for the dilation. Then graph the original image and the dilation, and compare and contrast the figures.  $M(-3, 1), A(1, 3), T(2, -2), H(-4, -2); k = \frac{1}{2}$

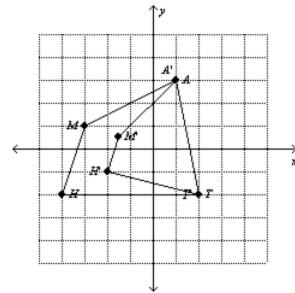
a)  $(x, y) \rightarrow (\frac{3}{4}x, \frac{3}{4}y); M' \left( -2\frac{1}{4}, \frac{3}{4} \right), A' \left( \frac{3}{4}, 2\frac{1}{4} \right), T' \left( 1\frac{1}{2}, -1\frac{1}{2} \right), H' \left( -3, -1\frac{1}{2} \right)$



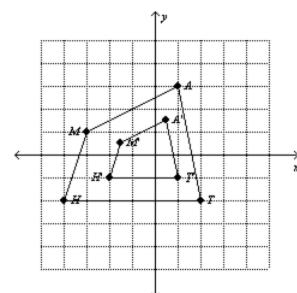
b)  $(x, y) \rightarrow (\frac{4}{5}x, \frac{4}{5}y); M' \left( -2\frac{2}{5}, \frac{4}{5} \right), A' \left( \frac{4}{5}, 2\frac{2}{5} \right), T' \left( 1\frac{3}{5}, -1\frac{3}{5} \right), H' \left( -3\frac{1}{5}, -1\frac{3}{5} \right)$



c)  $(x, y) \rightarrow (\frac{1}{2}x, \frac{1}{2}y); M' \left( -1\frac{1}{2}, \frac{1}{2} \right), A' \left( 1, 3 \right), T' \left( 2, -2 \right), H' \left( -2, -1 \right)$



d)  $(x, y) \rightarrow (\frac{1}{2}x, \frac{1}{2}y); M' \left( -1\frac{1}{2}, \frac{1}{2} \right), A' \left( \frac{1}{2}, 1\frac{1}{2} \right), T' \left( 1, -1 \right), H' \left( -2, -1 \right)$



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**UNIT 3**

26) Find the slope of the line that passes through  $(10, 17)$  and  $(7, 8)$ .

3

27) Find the slope of the line that passes through  $(-12, 1)$  and  $(4, 1)$ .

a)  $-\frac{13}{5}$

b)  $\frac{5}{13}$

c) 0

d) *undefined*

28) Find the slope of the line that passes through  $(4, 2)$  and  $(1, 3)$ .

a)  $\frac{5}{5}$

b)  $-\frac{1}{3}$

c)  $\frac{3}{5}$

d) 1

29) Find the slope of the line that passes through  $(-4, -2)$  and  $(-2, -4)$ .

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30) Find the slope of the line that passes through  $(-2, -3)$  and  $(4, -6)$ .

a)  $-\frac{3}{4}$

b)  $-\frac{1}{2}$

c)  $\frac{3}{4}$

d)  $-\frac{9}{6}$

31) What is the slope, or grade, of a road that rises 7 feet for every horizontal change of 35 feet?

hint: slope =  $\frac{\text{rise}}{\text{run}}$

a)  $m = \frac{1}{5}$

b)  $m = \frac{1}{7}$

c)  $m = -\frac{1}{5}$

d)  $m = -\frac{7}{35}$

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32) Determine whether the data set shows direct variation.

hint:  $y = kx$

time; min( $x$ )	3	4	5	6
distance; mi ( $y$ )	9	12	15	18

- a) no
- b) no there isn't a constant of variation
- c) yes;  $y = 3x$
- d) yes;  $y = \frac{1}{3}x$

33) Determine whether the data set shows direct variation.

hint:  $y = kx$

time; min( $x$ )	10	20	30	40
distance; mi ( $y$ )	25	50	75	100

- a) no
- b) no there isn't a constant of variation
- c) yes;  $y = 2\frac{1}{2}x$
- d) yes;  $y = \frac{1}{2.5}x$

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34) Which of these tables shows direct variation?

a)

$x$	-1	0	1	2
$y$	18	21	24	28

b)

$x$	-1	0	1	2
$y$	-3	0	3	6

c)

$x$	-1	0	1	2
$y$	1	3	6	10

d)

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

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35) Which equation gives the direct variation if  $y = 6$  when  $x = -3$  ?

a)  $y = -2x$

b)  $y = -\frac{1}{2}x$

c)  $y = 2x$

d)  $y = \frac{1}{2}x$

36) At Store A, balloons are sold individually. The cost "y" is equivalent to the price of individual balloons times "x" balloons purchased. Find the equation that represents the data in this table.

(hint:  $y = kx$ )

a)  $y = 6x$

# of balloons (x)	6	7	8	9
\$ cost (y)	15	17.5	20	22.5

b)  $y = 1.25x$

c)  $y = 1.5x$

d)  $y = 2.5x$

37) The table below shows the relationship between the cost of mulch at a local garden store and the number of square feet bought. Write an equation that represents the relationship of cost,  $y$ , to the number of square feet bought,  $x$ .

(hint:  $y = kx$ )

a)  $y = 4.25x$

# of square feet (x)	cost, \$ (y)
3	12.75
4	17
6	25.5
8	34

b)  $y = 8.5x$

c)  $y = 8.5x + 1$

d)  $y = 9.75x$

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38) Determine the constant rate of change between  $x$  and  $y$  in the table.

- a) \$10 per hour
- b) \$12 per hour**
- c) \$8 per hour
- d) \$8 per two hours

time (hours)	charge (\$)
1	10
2	22
3	34
4	46

39) Determine the constant rate of change between  $x$  and  $y$  in the table.

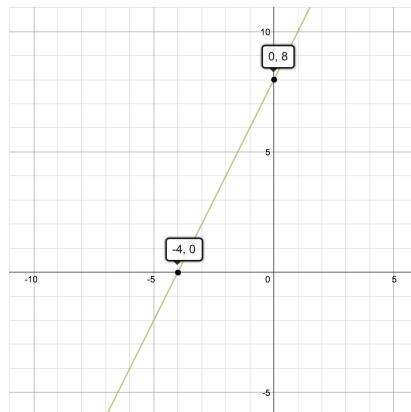
- a) -9 gallons per hour
- b) -3 gallons per hour**
- c) 3 gallons per hour
- d) 9 gallons per hour

time (hours)	$H_2O$ (gallons)
3	116
6	107
9	98
12	89

40) Find the equation for the linear function.

(hint:  $y = mx + b$ )

- a)  $y = \frac{1}{2}x - 4$
- b)  $y = -\frac{1}{2}x - 4$
- c)  $y = \frac{1}{2}x + 8$
- d)  $y = 2x + 8$**



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41) Write an equation in slope-intercept form for the line that passes through point  $(-3, -8)$ , and has a slope:  $-4$

a)  $y = \frac{4}{3}x - 3$

b)  $y = -4x - 8$

c)  $y = -\frac{4}{3}x - 4$

d)  $y = \frac{4}{3}x - 4$

42) Use the table to write an equation in slope-intercept form for the table.

(hint:  $y = mx + b$ )

a)  $y = 1.2x + 2.5$

$x$	-20	-10	-5	5	10	20
$y$	-2	0	1	3	4	6

b)  $y = 5x - 2$

c)  $y = \frac{1}{5}x + 2$

d)  $y = \frac{1}{5}x - 2$

43) Write an equation in slope-intercept form with the slope:  $5$  and y-int:  $-2$ .

hint:  $y = mx + b$

$m$  = slope

$b$  = y-int

a)  $y = \frac{2}{5}x + (-2)$

b)  $y = \frac{2}{5}x + 2$

c)  $y = 5x - 2$

d)  $y = \frac{2}{5}x + (-2)$

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44) Write an equation in slope-intercept form with the slope:  $-\frac{1}{3}$  and y-int: 4.

hint:  $y = mx + b$

$m = \text{slope}$

$b = y - \text{int}$

a)  $y = \frac{2}{5}x + (-2)$

b)  $y = \frac{2}{5}x + 2$

c)  $y = 5x + 2$

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

45) Find the equation for the linear function.

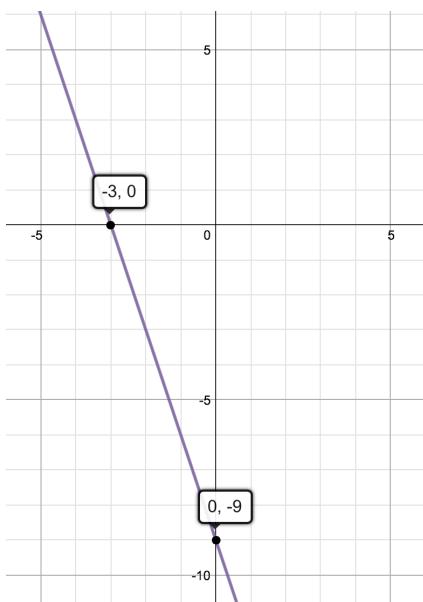
(hint:  $y = mx + b$ )

a)  $y = -\frac{1}{3}x - 9$

b)  $y = -\frac{1}{3}x - 3$

c)  $y = -3x - 9$

d)  $y = 3x - 9$



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## Some notes on Linear Equations

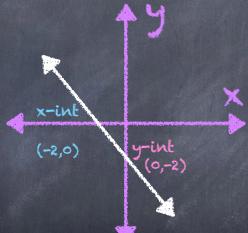
Find the x - and - y-intercepts

$$Ax + By = C$$

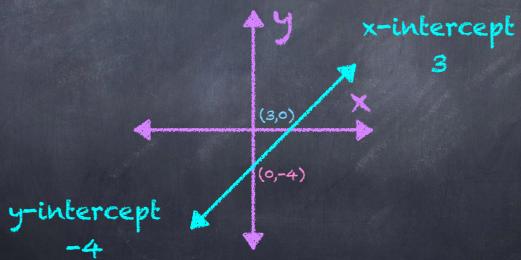
$$2x + 2y = -4$$

x-intercept  
-2

y-intercept  
-2



Find the x-intercept and y-intercept of the line  $4x - 3y = 12$ . Use the intercepts to graph the equation.



Determine the y-int

Hours Rented	-6	-3	0	3	6
Cost (\$)	13	-1	-15	-29	-43

$$y\text{-int} = -15$$

What are the x- and y-intercepts for the graph of  $-3x+y = -9$

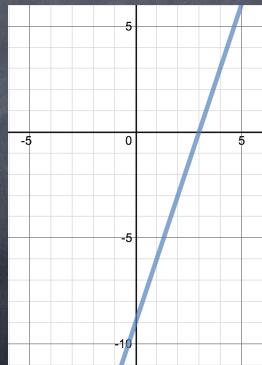
$$x\text{-int} = 3$$

$$y\text{-int} = -9$$

hint:

x-intercept:  $(x, 0)$

y-intercept:  $(0, y)$



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46) What are the slope and  $y$ -intercept for the graph of  $y + 3x = -6$ ?  
(hint:  $y = mx + b$ )

- a)  $m = -3; y - \text{int} = -6$
- b)  $m = 3; y - \text{int} = 3$
- c)  $m = \frac{1}{3}; y - \text{int} = -3$
- d)  $m = -\frac{1}{3}; y - \text{int} = 6$

47) What are the  $x$ - and  $y$ -intercepts for the graph of  $5x - 10y = 20$ ?

- a)  $x - \text{int} = 4; y - \text{int} = -2$
- b)  $x - \text{int} = 4; y - \text{int} = 10$
- c)  $x - \text{int} = 5; y - \text{int} = 10$
- d)  $x - \text{int} = -4; y - \text{int} = -2$

48) What is the equation of the line that passes through  $(-1, 6)$  and  $(-2, -8)$ ?

hint:  $y = mx + b$   
 $m = \text{slope}$   
 $b = y - \text{int}$

- a)  $y = 14x - 4$
- b)  $y = 14x + 20$
- c)  $y = -14x + 4$
- d)  $y = \frac{1}{14}x - 4$

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49) Find the x- and y-intercepts of the line  $6x + 5y = -15$

hint:

$x - \text{int}: (x, 0)$

$y - \text{int}: (0, y)$

a)  $x - \text{int} = 25$ ;  $y - \text{int} = -3$

b)  $x - \text{int} = 2.5$ ;  $y - \text{int} = -5$

c)  $x - \text{int} = 2\frac{1}{2}$ ;  $y - \text{int} = -3$

d)  $x - \text{int} = -2\frac{1}{2}$ ;  $y - \text{int} = -3$

50) State the slope and the y-intercept for the graph of the equation

$$y = -4x + 5$$

hint:  $y = mx + b$

$m = \text{slope}$

$b = y - \text{int}$

a) 5; -4

b) 5; 4

c) -4; 5

d) 4; 5

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51) Determine the y-intercept.

- a) -12
- b) 12
- c) -2
- d) 2

<i>time (hours)</i>	<i>charge (\$)</i>
1	10
2	22
3	34
4	46

52) Determine the y-intercept.

- a) -3
- b) 0
- c) 119
- d) 125

<i>time (hours)</i>	$H_2O(gallons)$
3	116
6	107
9	98
12	89

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- 53) The table shows the amount of money Ali is paid for working different numbers of hours. What would be Ali's total pay if he works for 27 hours in a week?

\$378

					.		
+ -	0 1 2 3 4 5 6 7 8 9						

# of hours	\$ paid
3	42
5	70
7	98
9	126

- 54) Each total ticket price shown in the table below includes an \$8.50 service fee. If the price per ticket is constant, how much can Greg expect to pay for 9 tickets, including the service fee?

\$116.50

					.		
+ -	0 1 2 3 4 5 6 7 8 9						

# of tickets	\$ Total Paid
4	\$56.50
9	?
12	\$152.50
14	\$176.50

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55) Clark starts out with a certain number of baseball cards and plans to collect 8 each month. At the end of a year, he has 109 baseball cards. Assume the relationship is linear. Determine and interpret the rate of change and the initial value.

- a)  $\text{rate} = 8 \text{ cards per month}; \text{initial value} = 96$
- b)  $\text{rate} = 8 \text{ cards per month}; \text{initial value} = 101$
- c)  $\text{rate} = 8 \text{ cards per month}; \text{initial value} = 13$
- d)  $\text{rate} = 8 \text{ cards per month}; \text{initial value} = 12$

56) What is an equation for the line that passes through  $(-2, -3)$  with a slope of  $-\frac{1}{2}$ ?

- a)  $4y + 2x = 7$
- b)  $4y - 2x = -12$
- c)  $4y + 2x = -16$
- d)  $5y - 4x = 12$

57) What is the *point – slope form* equation for the line with a slope of  $-\frac{2}{3}$  that passes through  $(5, 2)$ ?

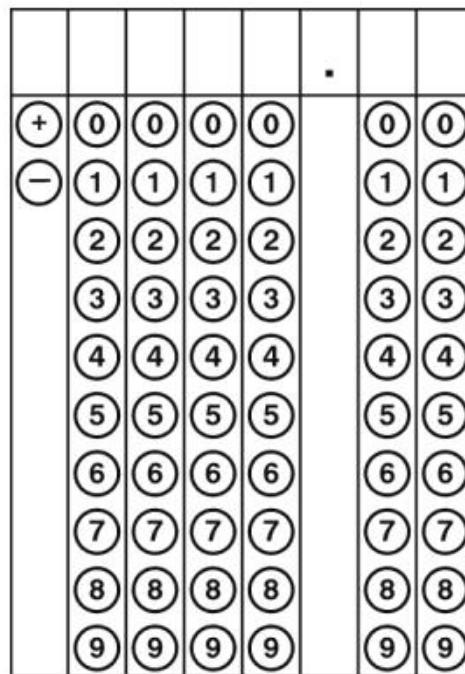
- a)  $y - 5 = -\frac{2}{3}(x - 2)$
- b)  $y - 2 = -\frac{2}{3}(x - 5)$
- c)  $y + 5 = -\frac{2}{3}(x - 2)$
- d)  $y + 2 = -\frac{2}{3}(x - 5)$

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58) The points in the table lie on a line. What is the value of  $y$  when  $x$  is  $-26$ ?

4

$x$	$y$
-4	-7
-2	-8
-1	-8.5
1	-9.5
2	-10
4	-11



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**UNIT 4**

**59)** Determine the domain and range for the relation  $\{(-1, 4), (0, 2), (2, -1), (5, -4)\}$ .  
a)

$$D: \{-1, 0, 2, 5\}$$

$$R: \{-4, -1, 2, 4\}$$

b)

$$D: \{-1, 0, 2, 5\}$$

$$R: \{-4, -1, 2\}$$

c)

$$D: \{-4, -1, 2, 4\}$$

$$R: \{-1, 0, 2, 5\}$$

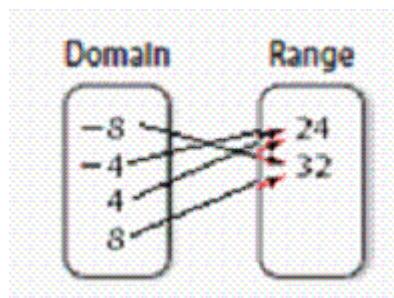
d)

$$D: \{-4, -1, 0\}$$

$$R: \{2, 4, 5\}$$

**60)** Determine whether the relation is a function. Explain.

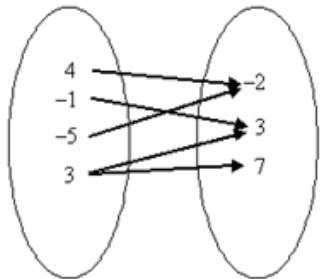
- a) Yes, the relation is a function
- b) No, the relation isn't a function
- c) Not enough information
- d) Fails the vertical line test



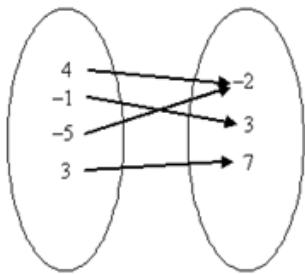
Name \_\_\_\_\_

61) Which relation is a function?

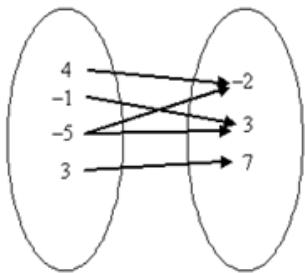
a) Type equation here.



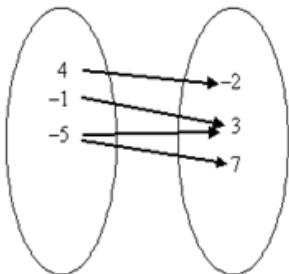
b) **Function**



c) Type equation here.



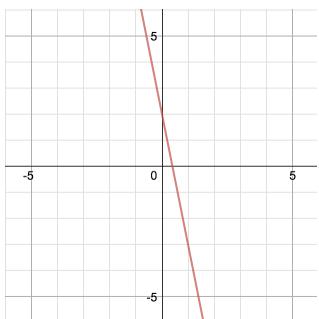
d) Type equation here.



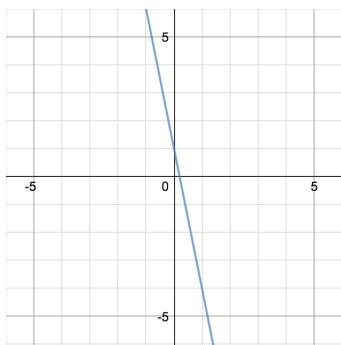
Name \_\_\_\_\_

62) Graph the function  $y = 5x + 2$

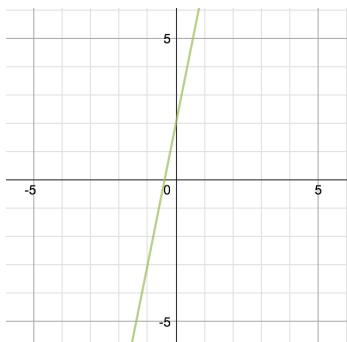
a)  $y = 5x + 2$



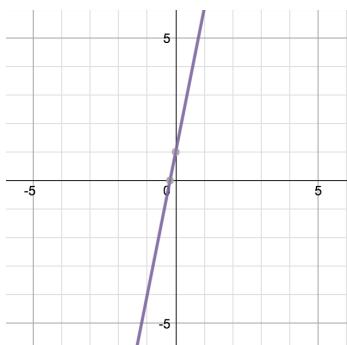
b)  $y = 5x + 2$



c)  $y = 5x + 2$



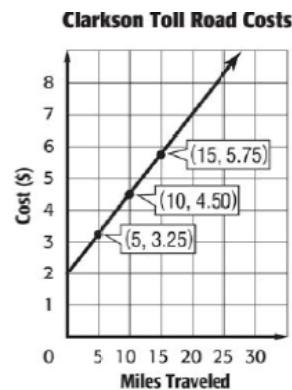
d)  $y = 5x + 2$



Name \_\_\_\_\_

- 63) The table shows the cost for traveling on a toll road in Henderson. The graph shows the cost of traveling on a toll road in Clarkson. Compare the linear functions to determine whether each toll road is proportional or non-proportional. Explain why.

Henderson Toll Road Costs	
Miles Traveled	Cost (\$)
10	3
20	6
30	9



a) *Henderson's toll road is proportional, but*

*Clarkson's toll road is not proportional*

b) *Henderson's toll road is proportional, and*

*Clarkson's toll road is proportional*

c) *Clarkson's toll road is proportional, and*

*Henderson's toll road is proportional*

d) *Clarkson's toll road is proportional, but*

*Henderson's toll road is not proportional*

- 64) A music store gives each customer a free CD worth \$12.50. Is the function proportional or non-proportional? Explain.

a) proportional; The ratios of cost to number of customers are not equal.

b) non-proportional; The ratios of cost to number of customers are equal.

c) non-proportional; The ratios of cost to number of customers are not equal.

d) proportional; The ratios of cost to number of customers are equal.

Name \_\_\_\_\_

65) Given the linear table below. What is the value of  $y$  when  $x$  is 12?

- a) -6
- b) -5
- c) 5
- d) 6

$x$	$y$
-8	0
-4	1
4	3
8	4