

Name: Key

Section: _____

Date: _____

Unit 3 Pre-Test

This is worth 10% of your final test grade. Submit on the day of the test.

1. For each equation, determine whether it is linear.

Equation	Is the equation linear?	
	Yes	No
$y = x + 9$	<input checked="" type="checkbox"/>	<input type="checkbox"/>
$y = -2x^3$	<input type="checkbox"/>	<input checked="" type="checkbox"/>
$y = 4^x$	<input type="checkbox"/>	<input checked="" type="checkbox"/>
$y = x^2 + 7$	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2. For each equation, determine whether it is linear.

Equation	Is the equation linear?	
	Yes	No
$4x = -9$	<input checked="" type="checkbox"/>	<input type="checkbox"/>
$y - \frac{2}{x} = 0$	<input type="checkbox"/>	<input checked="" type="checkbox"/>
$0.02x - 0.9y = 3.3$	<input checked="" type="checkbox"/>	<input type="checkbox"/>
$9x - 8 + 5y = x - 3$	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3. The equation of a line is given below.

$$6x - y = 6$$

Find the x-intercept and the y-intercept. Then use them to graph the line.

x-intercept: 1
y-intercept: _____

x-int

$$6x - 0 = 6$$

$$6x = 6$$

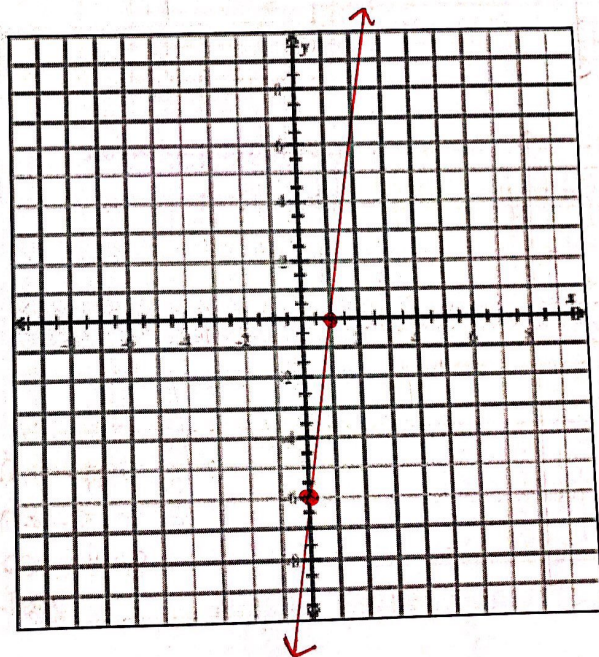
$$x = 1$$

y-int

$$6(0) - y = 6$$

$$-y = 6$$

$$y = -6$$



4. The equation of a line is given below.

$$4x + 2y = -8$$

Find the x-intercept and the y-intercept.
Then use them to graph the line.

x-intercept: $\frac{-2}{-}$
y-intercept: $\frac{-4}{-}$

x-int

$$4x + 2(0) = -8$$

$$4x = -8$$

$$x = -2$$

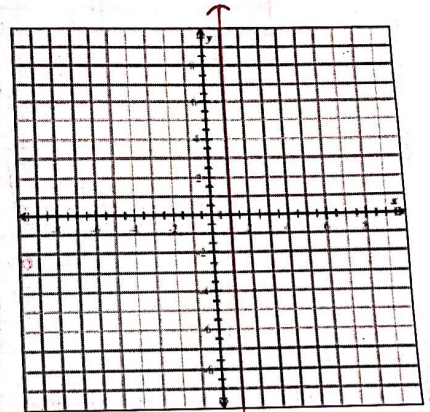
y-int

$$4(0) + 2y = -8$$

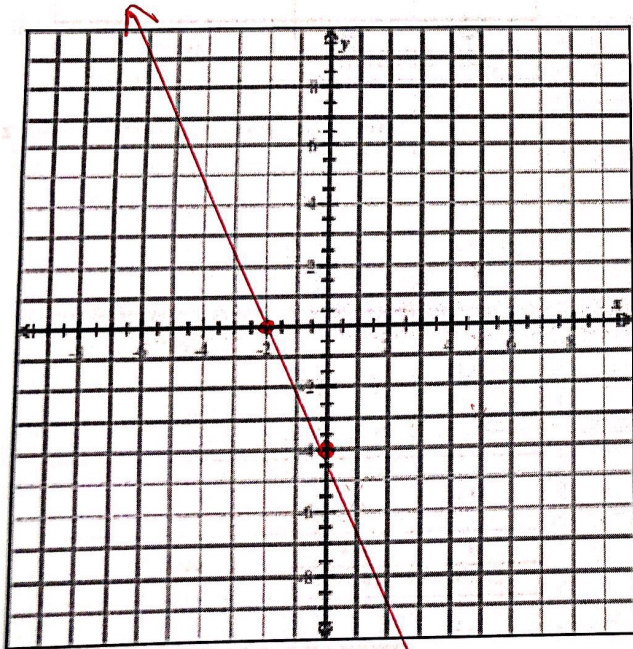
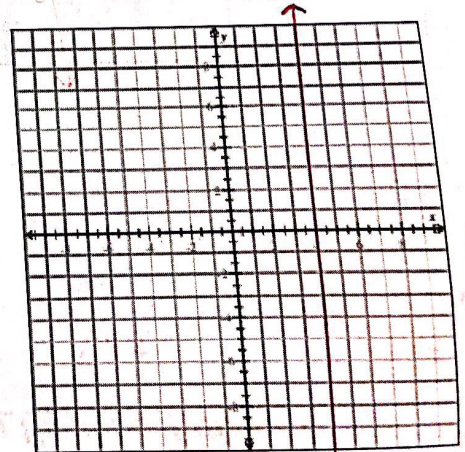
$$2y = -8$$

$$y = -4$$

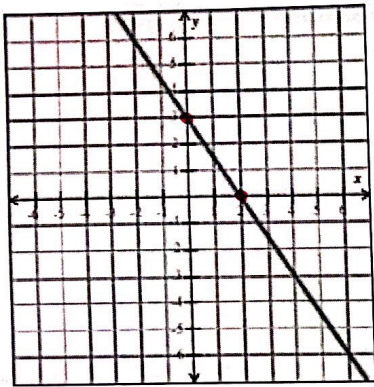
5. Graph the line $x = 1$.



6. Graph the line $x = 4$.

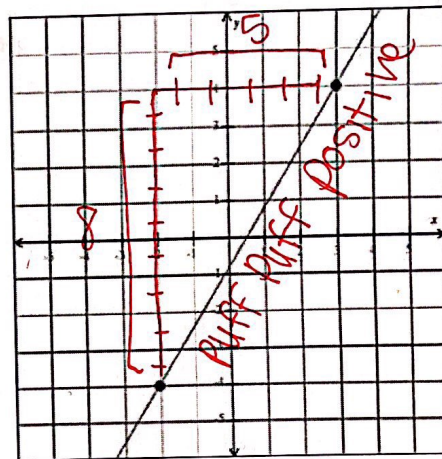


7. Find the y-intercept and the x-intercept of the line below.



$x\text{-int} = 2$
 $y\text{-int} = 3$

9. Find the slope of the line graphed below.



Slope: $\frac{8}{5}$

8. Find the y-intercept and x-intercept of the line.

$$3x - y = 6$$

y-intercept: -6

x-intercept: 2

X-int y-int

$$3x - 0 = 6$$

$$3(0) - y = 6$$

$$\frac{3x}{3} = \frac{6}{3}$$

$$\frac{-y}{-1} = \frac{6}{-1}$$

$$x = 2$$

$$y = -6$$

10. Find the slope of the line passing through the points (6, -7) and (2, -4).

$$\frac{\Delta y}{\Delta x} = m$$

$$\frac{y_2 - y_1}{x_2 - x_1} = m$$

Δx	x	y	$\Delta y =$
-4	6	-7	+3
2		-4	

$$\frac{-4 + (+7)}{2 - 6} = \frac{3}{-4} = m$$

$$\boxed{-\frac{3}{4} = m}$$

11. Fill in the blanks below.

Find the slope of the line passing through the points $(-4, 6)$ and $(-9, 6)$.

slope: 0

Find the slope of the line passing through the points $(-2, -3)$ and $(6, -3)$.

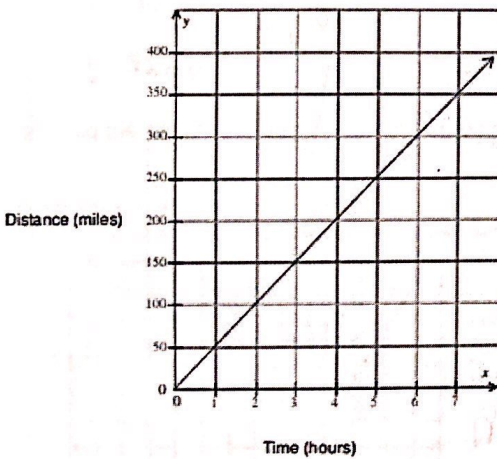
slope: 0

$$\frac{6-6}{-9-(-4)} = \frac{0}{-5} = 0$$

$$\frac{-3-(-3)}{6-(-2)} = \frac{0}{8} = 0$$

12. After crossing a bridge, Juan drives at a constant speed. The graph below shows the distance (in miles) versus the time since he crossed the bridge (in hours).

Use the graph to answer the questions.



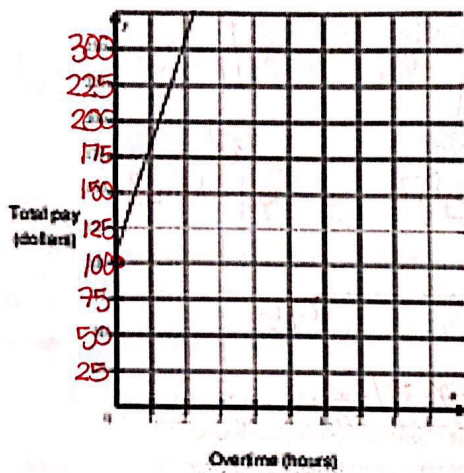
(a) What is the slope of the line?

$m = 50$

(b) How much does the distance increase for each hour since Juan crossed the bridge?

50 miles

13. Each day, Greg earns a fixed wage plus extra money for every hour of overtime he works. The graph shows his total pay (in dollars) versus the amount of overtime (in hours) that he works.



(a) What is Greg's total pay with 0 hours of overtime?

\$ 100

(b) Choose the statement that best describes how the amount of overtime and total pay are related. Then fill in the blank.

As the amount of overtime increases, the total pay decreases.

At what rate is the total pay decreasing?

\$ _____ per hour

As the amount of overtime increases, the total pay increases.

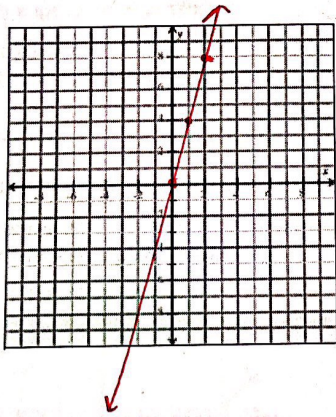
At what rate is the total pay increasing?

\$ 75 per hour

14. Graph the line.

$y = 4x$

Please make sure to plot 3 points



16. For each equation, determine whether it shows a direct variation (that is, shows directly proportional variables).

If it does, find the constant of variation and write it in simplest form.

$7x + 6y = -1$ ← can't have "extra" number <input type="radio"/> Direct variation Constant of variation: $k = \square$ <input checked="" type="radio"/> Not direct variation
$14x - 7y = 0$ $\frac{14x}{7} = \frac{7y}{7}$ $y = 2x$ <input checked="" type="radio"/> Direct variation Constant of variation: $k = 2$ <input type="radio"/> Not direct variation

15. Suppose that y varies directly with x , and $y = 9$ when $x = 18$.

(a) Write a direct variation equation that relates x and y .
Equation: $y = \frac{1}{2}x$
(b) Find y when $x = 5$.
$y = \frac{5}{2}$

$\frac{9}{18} = \frac{m}{18}$
 $m = \frac{1}{2}$
 $y = \frac{1}{2}(5)$
 $y = \frac{5}{2}$

Arithmetic Sequence Formula:

$$a_n = a_1 + (n - 1)d$$

17. The first three terms of an arithmetic sequence are as follows.

19, 28, 37

Find the next two terms of this sequence.

46, 55

18. For each sequence, determine whether it appears to be arithmetic. If it does, find the common difference.

2, -10, 50, -250, ...	<input type="radio"/> Arithmetic Common difference: $d = \square$ <input checked="" type="radio"/> Not arithmetic
12, 15, 19, 23, ...	<input type="radio"/> Arithmetic Common difference: $d = \square$ <input checked="" type="radio"/> Not arithmetic
-9, -16, -23, -30, ...	<input checked="" type="radio"/> Arithmetic Common difference: $d = \square - 7$ <input type="radio"/> Not arithmetic

19. Find the 71st term of the following arithmetic sequence.

12, 20, 28, 36, ...
+8

$$a_{71} = 12 + (70 - 1)8$$

$$12 + 69(8)$$

$$a_{71} = 564$$

20. Find the 16th term of the arithmetic sequence whose common difference is $d = 6$ and whose first term is $a_1 = 1$.

$$a_{16} = 1 + (16 - 1)6$$

$$a_{16} = 1 + (15)(6)$$

$$a_{16} = 91$$