Name: _____ 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
$y = x + 9$	○	○
$y = -2x^3$	○	○
$y = 4^x$	○	○
$y = x^2 + 7$	○	○

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

Equation	Is the equation linear?	
	Yes	No
$4x = -9$	○	○
$y - \frac{2}{x} = 0$	○	○
$0.02x - 0.9y = 3.3$	○	○
$9x - 8 + 5y = x - 3$	○	○

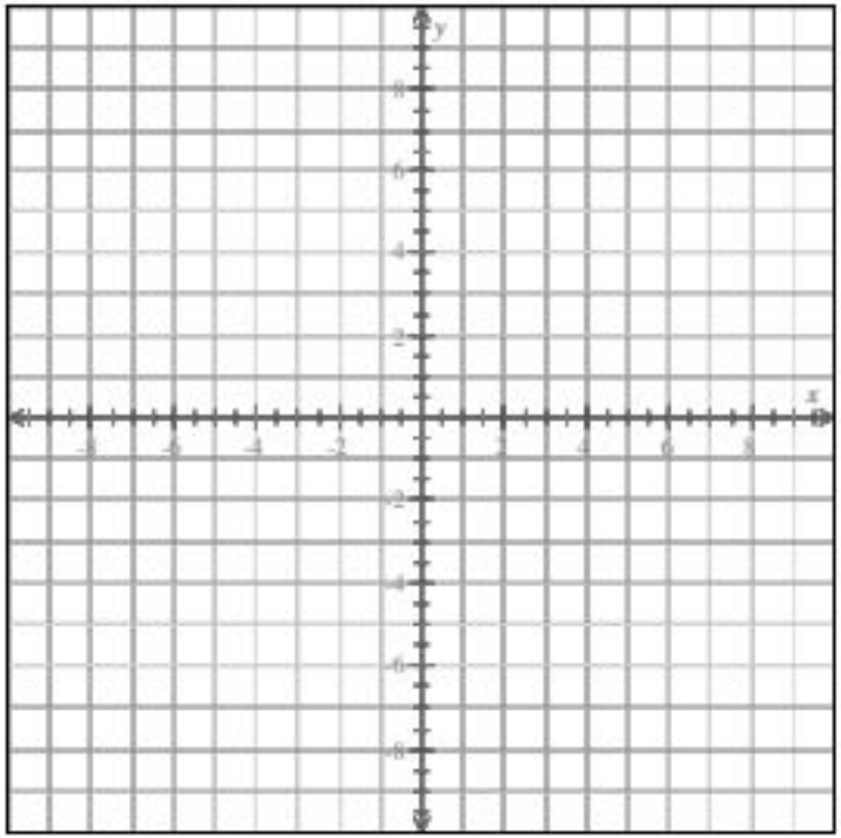
3. The equation of a line is given below.

$$6x - y = 6$$

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

x-intercept: _____

y-intercept: _____



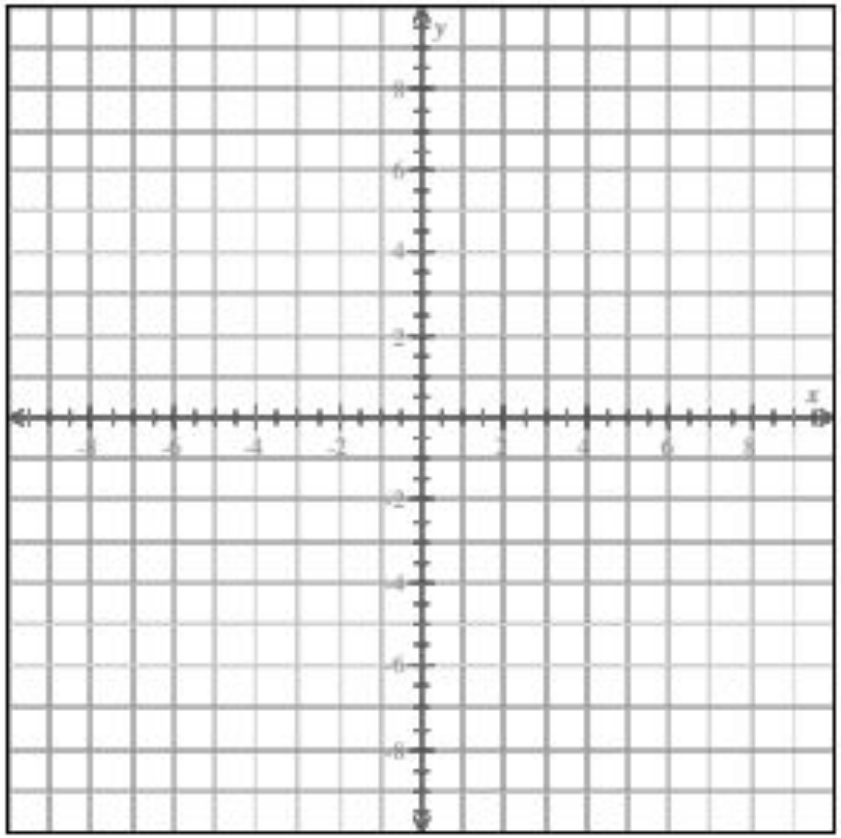
4. The equation of a line is given below.

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

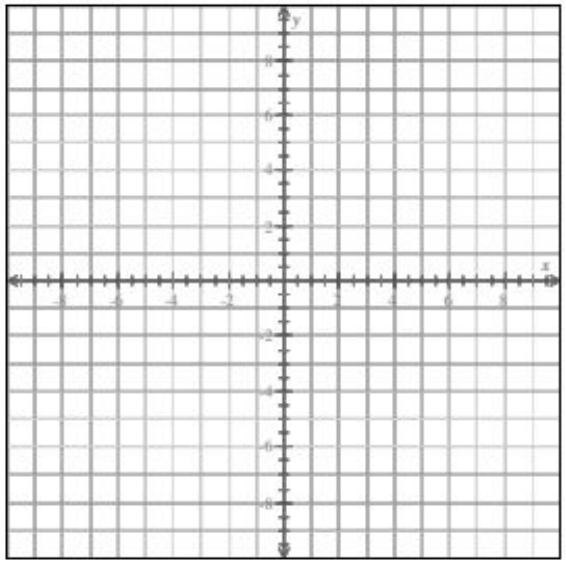
Find the x-intercept and the y-intercept.
Then use them to graph the line.

x-intercept: _____

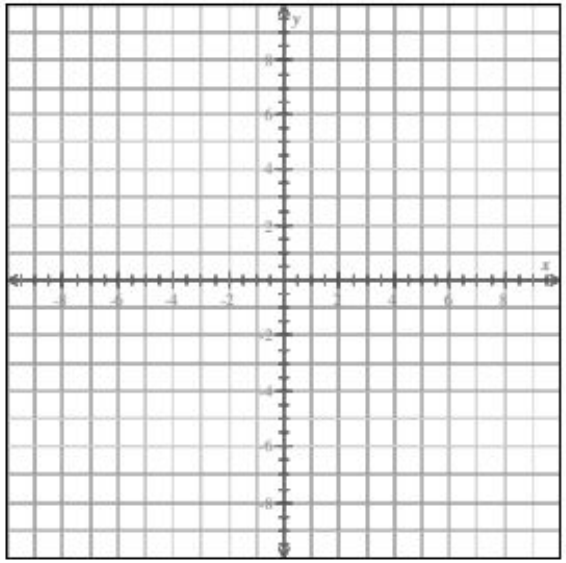
y-intercept: _____



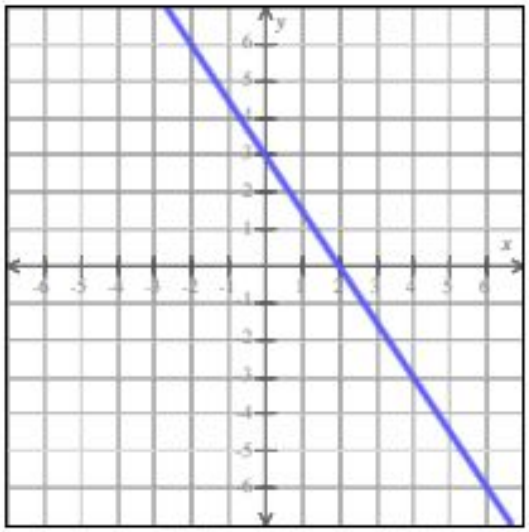
5. Graph the line $x = 1$.



6. Graph the line $x = 4$.



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



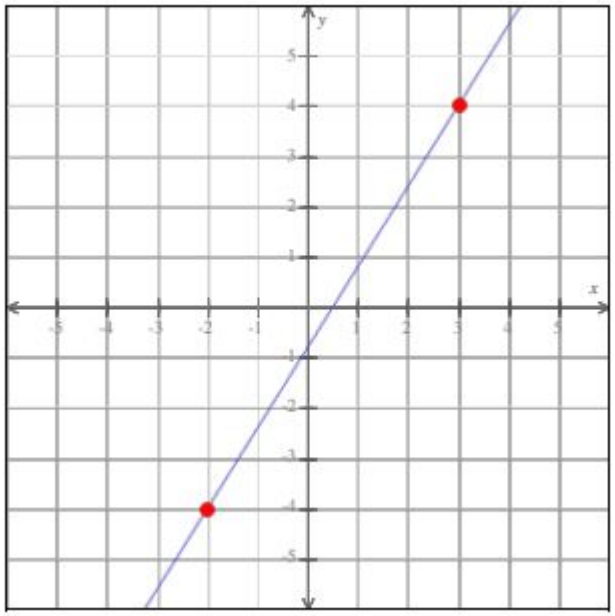
8. Find the y-intercept and x-intercept of the line.

$3x - y = 6$

y-intercept: _____

x-intercept: _____

9. Find the slope of the line graphed below.



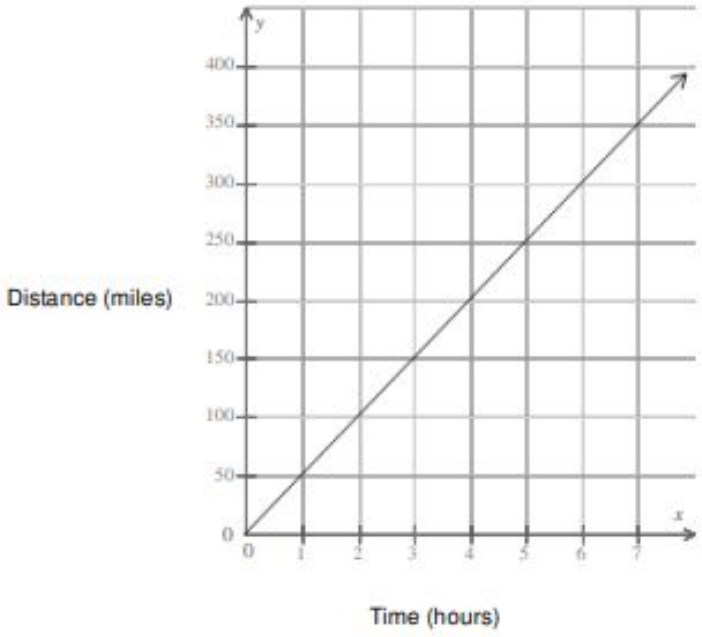
10. Find the slope of the line passing through the points $(6, -7)$ and $(2, -4)$.

11. Fill in the blanks below.

Find the slope of the line passing through the points $(-4, 6)$ and $(-9, 6)$.
slope: ☐
Find the slope of the line passing through the points $(-2, -3)$ and $(6, -3)$.
slope: ☐

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.



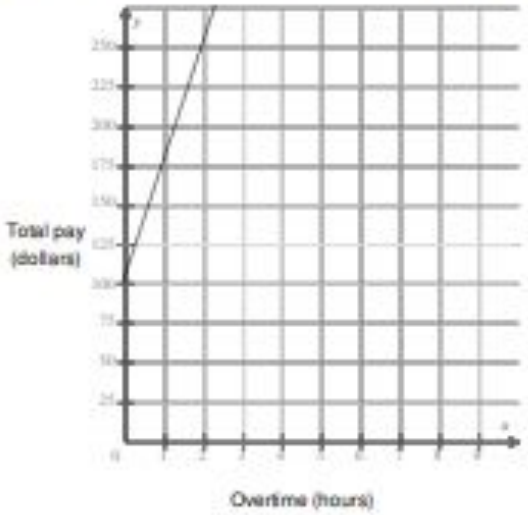
(a) What is the slope of the line?

_____

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

_____ 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?

$\_\_\_\_\_$

(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

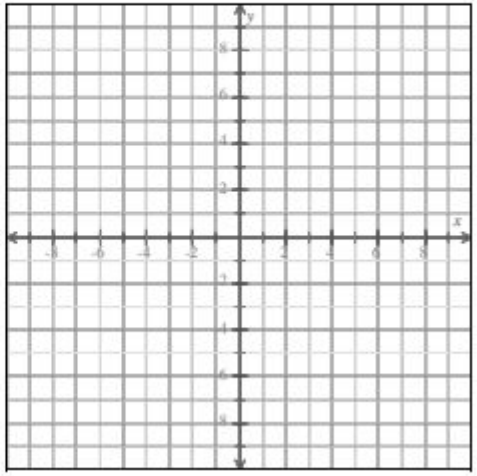
- As the amount of overtime increases, the total pay increases.

  At what rate is the total pay increasing?

  $\_\_\_\_\_$ per hour

14. Graph the line.

$y = 4x$



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:
(b) Find y when $x = 5$.
$y =$

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.

$7x + 6y = -1$

- ○ Direct variation

  Constant of variation: $k =$ ☐

- ○ Not direct variation

$14x - 7y = 0$

- ○ Direct variation

  Constant of variation: $k =$ ☐

- ○ Not direct variation

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.

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

2, −10, 50, −250, ...	○ Arithmetic Common difference: $d =$ ☐ ○ Not arithmetic
12, 15, 19, 23, ...	○ Arithmetic Common difference: $d =$ ☐ ○ Not arithmetic
−9, −16, −23, −30, ...	○ Arithmetic Common difference: $d =$ ☐ ○ Not arithmetic

19. Find the 71^{st} term of the following arithmetic sequence.

12, 20, 28, 36, ...

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