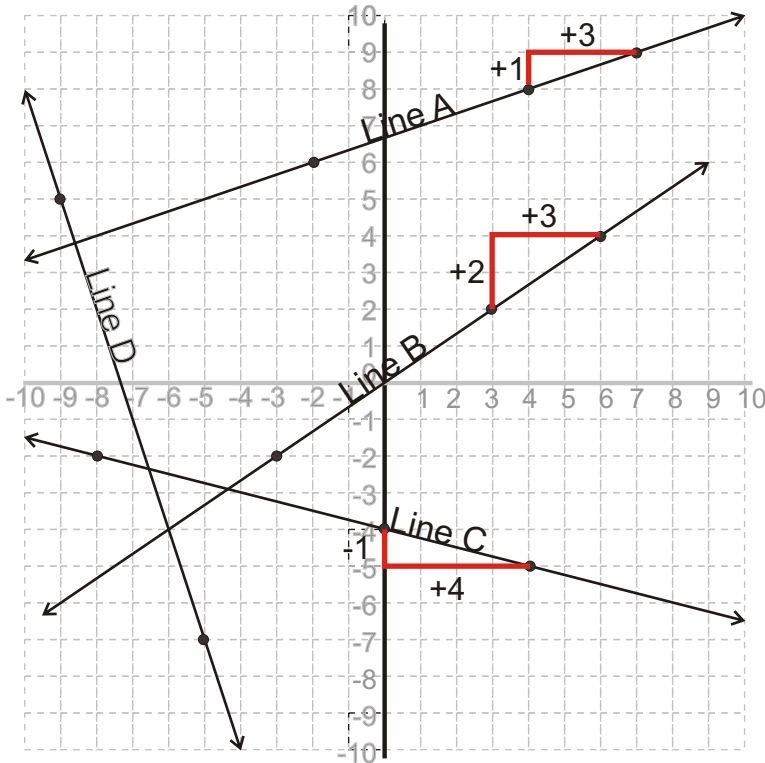


# Linear Concepts

## Mixed Practice



1) What is the slope of line A?

*Pick any two points on Line A. First find the rise.(change in y) That is the numerator. The denominator is the change in x or the run. The rise is up one and the run is over three so the slope is  $1/3$ .*

2) What is the slope of line B?

*Pick the two closest points. The change in y is up or positive 2. The change in x is over 3. The slope is  $2/3$ .*

3) What is the equation for line B in  $y = mx + b$  form?

*Because line B crosses the y-axis at zero, b or the y-intercept is zero. The b in the equation can be dropped if the y-intercept is zero. Replace the m with the slope which is  $2/3$ . The answer is  $y = 2/3 x$ .*

4) What is the equation which represents line C in  $y = mx + b$  form?

*The slope(m) is  $-1/4$  and the y-intercept(b) is  $-4$  so the equation representing the line is  $y = -1/4x - 4$*

5) Study line D. Find the corresponding y-values for each of the given x-values.

x	y
-9	5
-8	2
-7	-1
-6	-4
-5	-7

Find the slope and y-intercept for each of the following equations.

6)  $y = 3/4x + 6$

slope =  $3/4$

y-intercept =  $6$

7)  $y = x + 6$

slope =  $1$

y-intercept =  $6$

8)  $-6x + 3y = 15$

slope =  $2$

y-intercept =  $5$

*(hint: To find the y-intercept of an equation not in y-form, simply plug a zero in to the x variable and solve for the y-value.)*

9)  $9x + 3y = -21$

slope =  $-3$

y-intercept =  $-7$

10)  $4x - 2y = -12$

slope =  $2$

y-intercept =  $6$

11)  $y = 4x + 9$

slope =  $4$

y-intercept =  $9$

To find the slope of a line not in y-form, change the equation into y-form by isolating the y-variable.

12) Which equation represents a line going through these two points? (-5,-8) (10,1)

a)  $y = -1/2x + 10$

b)  $y = 3/5x - 5$

c)  $y = 1/2x + 10$

d)  $y = -2/5x + 5$

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{1 - (-8)}{10 - (-5)} = \frac{9}{15} = \frac{3}{5}$$

The only equation with a slope of  $3/5$  is b.

13) Which equation represents a line going through these two points? (-8,-10) (8,6)

a)  $y = x - 2$

b)  $y = x + 2$

c)  $y = x - 3$

d)  $y = x + 3$

It would not do any good to find the slope because all of the choices have a slope of 1.

In this case simply choose one of the given points such as (8,6) and plug the x and y values into each equation.

When testing choice a)  $y = x - 2$  plug (8,6) into the x and y values.

$6 = 8 - 2$  After "plugging in" the numbers we see that we have a true statement. The other point should also yield a true

14) Study the table. Which of the following equations would generate the table shown?

x	y
-4	-8
-2	-7
0	-6
2	-5
4	-4

a)  $y = 1/2x + 6$

b)  $y = 2x - 6$

c)  $y = 1/2x - 6$

d)  $y = 3x + 6$

15) Which set of ordered pairs represents a linear relationship?

a)  $\{(1,3) (2,5) (1,7)\}$

b)  $\{(-2,5) (0,6) (2,7)\}$

c)  $\{(4,9) (2,8) (0,9)\}$

d)  $\{(-5,3) (-4,5) (-3,8)\}$

x's increase by 2 and the y's by 1.

Eliminate choice A because you should notice the x value follows no pattern.

Choice C has a duplicate y-value so eliminate that choice and D does not follow any pattern.

16) What is the slope of a line which passes through these two points? (-3, -5) (4, 9)

a)  $1/2$

b) -2

c) -1/2

d) 2

17) Which of the following is the y-intercept of the equation  $3x - 4y = 20$ ?

a) (0,-5)

b) (0,5)

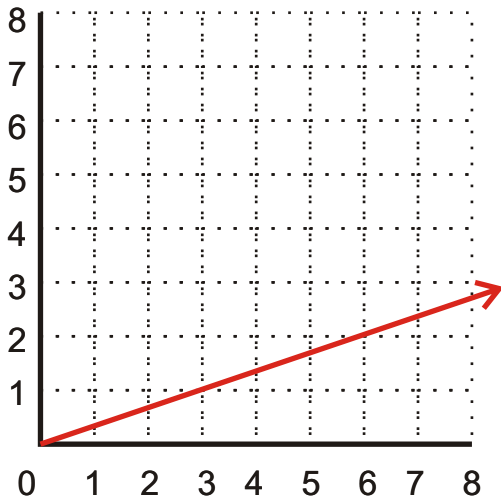
c) (0,3)

d) (0,-4)

When the equation is not in y-form, simply plug the number zero in for the x-value and solve for y.

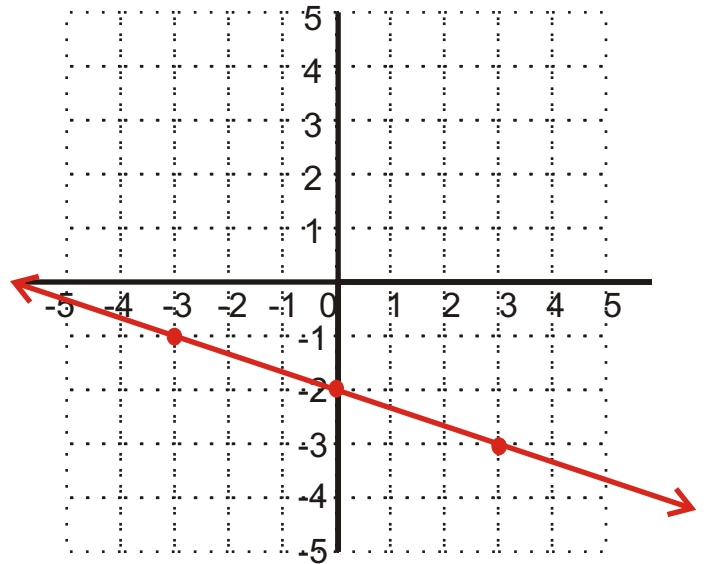
$$\begin{aligned} 3x - 4y &= 20 \\ 3(0) - 4y &= 20 \\ -4y &= 20 \\ y &= -5 \end{aligned}$$

18) Graph the equation  $y = 1/3x$ .

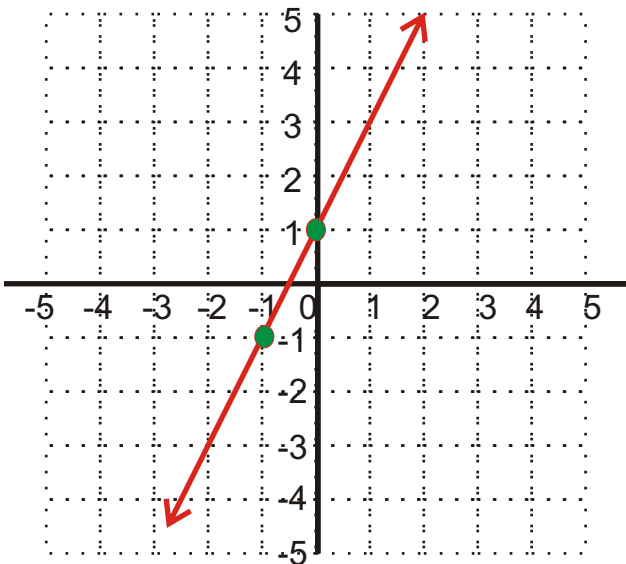


Note that any equation with no y-intercept crosses the y-axis at zero.

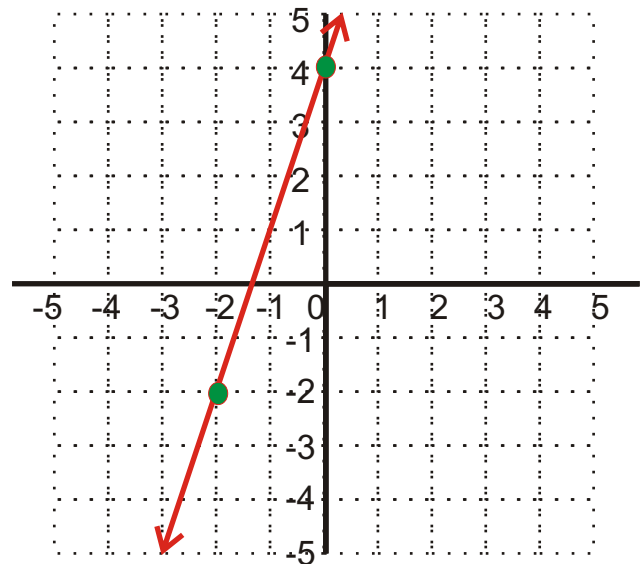
19) Graph the equation  $y = -1/3 - 2$



19) Graph the equation  $y = 2x + 1$



20) Graph the equation  $y = -3x + 4$



21) The slope of a line with the following points  $(-4,3)$   $(-2,3)$   $(2, 3)$  is: a) undefined b) zero c) 2 d) 1

22) The slope of a line with the following points  $(3, -2)$   $(3,-3)$   $(3,-4)$  is: a) undefined b) zero c) -1 d) 4

23) The y-intercept of the equation  $y = 4x$  is: a) 4 b)  $1/4$  c) zero d) 1

24) The y-intercept is: a) change in y b) change in x c) where a line crosses the y-axis d) perpendicular

25) Two different lines that have the same slope are: a) perpendicular b) parallel c) vertical d) horizontal