

Find rates of change, or slopes

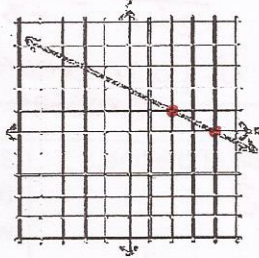
1. a. Find the slope of the line through (-1, 2) and (5, -13)

$$\frac{-13-2}{5-(-1)} = \frac{-15}{6} = -\frac{5}{2}$$

b. Find the slope of the line through  $(\frac{3}{2}, 5)$  and  $(-\frac{1}{2}, 8)$ ?

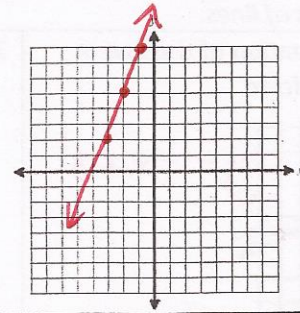
$$\frac{8-5}{-\frac{1}{2}-\frac{3}{2}} = \frac{3}{-\frac{4}{2}} = -\frac{3}{2}$$

2. Find the slope of the line



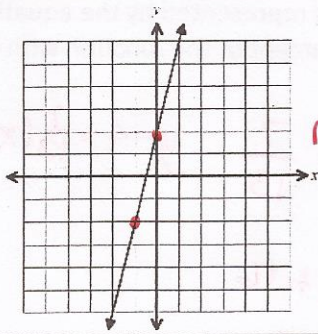
$$-\frac{1}{2}$$

3. A line graphed on the coordinate plane has a slope of 3 and contains the point (-2, 5). Find two other points on this line.



4. Given the graph and equation, which has a larger slope. Explain.

Line A



$$m = \frac{4}{1}$$

Line B

$$3x - y = 12$$

$$y = 3x - 12$$

$$m = \frac{3}{1}$$

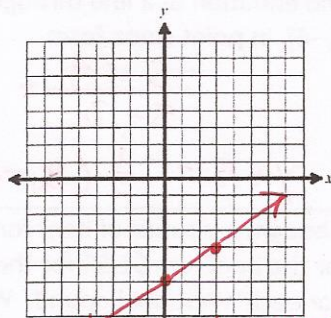
Line a has a larger / steeper slope

Graph Equations of lines

1. Graph  $f(x) = \frac{2}{3}x - 6$ . Find the slope and y-intercept and determine whether the graph is increasing or decreasing.

$$m = \frac{2}{3}$$

$$y\text{-int} = -6$$



increasing

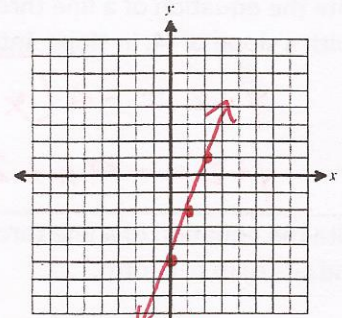
2. Graph  $6x = 2y + 10$ . Find the slope and y-intercept and determine if the graph is increasing or decreasing.

$$2y = 6x - 10$$

$$y = 3x - 5$$

$$m = 3$$

$$y\text{-int} = -5$$



increasing

3. How would the graphs of  $f(x) = -5x + 4$  and  $g(x) = -5x - 1$  compare if graphed on the same coordinate plane?

They are parallel.  
 $g(x)$  is down the y-axis by 5 units.

4. A student graphed the line  $3x - y = 2$ . If he substitutes the number 4 in for the number 2 in the equation, how will the graph of the line change?

yes, it will translate up the y-axis.

5. A student graphed the line  $2x - y = 5$ . If he substitutes the number 4 in for the number 2 in the equation, how will the graph of the line change?

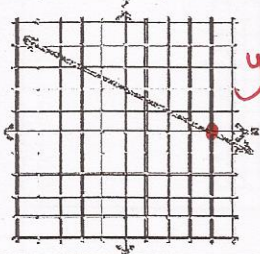
the slope will get steeper

6. Which of the following properly describes the line through the points (1, 8) and (-2, -7)? (Which way does the line slant, at what rate and where does it cross the y-axis)

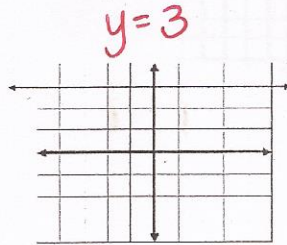
$y - 8 = 5(x - 1)$   
 $y - 8 = 5x - 5$   
 $y = 5x + 3$   
 $\frac{-7 - 8}{-2 - 1} = \frac{-15}{-3} = 5$   
 it is increasing by a rate of  $\frac{5}{1}$   
 crosses the y-axis at 3.

Write equations of lines.

1. Write the equation of the line in slope intercept form



2. Write the equation of the line.



3. Write the equation of a line through the point (-5, -3) with an undefined slope.

$$x = -5$$

3. a. Write the equation of a line in slope-intercept form from the table given.

x	f(x)
3	-3
9	-8
27	-13

$y + 3 = -\frac{5}{6}(x - 3)$   
 $y + 3 = -\frac{5}{6}x + \frac{5}{2}$   
 $y = -\frac{5}{6}x - \frac{1}{2}$

4. A linear function passes through the points (8, 4) and (-5, -3). A second function is represented by the equation  $3x - 4y = 16$ . What is the y-intercept of the function with the greater rate of change?

$\frac{4 - (-3)}{8 - (-5)} = \frac{7}{13}$   
 $y - 4 = \frac{7}{13}(x - 4)$   
 $-4y = -3x + 16$   
 $y = \frac{3}{4}x - 4$   
 y-int = -4

b. Write the equation of a line for the given table in slope intercept form

x	-2	0	2	5
y	15	9	3	-6

$m = -\frac{1}{3}$

5. Write the equation of a line through the point (6, -2) with a slope of -4, in slope intercept form.

$y + 2 = -4(x - 6)$   
 $y + 2 = -4x + 24$   
 $y = -4x + 22$

6. Write the equation of a line through the points (5, -5) and (3, -4), in point slope form.

$\frac{-5 + 4}{5 - 3} = \frac{-1}{2}$   
 $y + 5 = -\frac{1}{2}(x - 5)$

7. Write the equation of a line through the points (2, 6) and (-5, 6) in h, k form.

$y = 6$

8. a. John bought x pounds of beef for a barbeque. The price for the beef was \$1.59 for the first pound and \$1.19 for each additional pound. Write an equation that shows how the cost of ground beef depends on the number of pounds x.

$1.59 + 1.19x = y$

b. An exercise program begins the first week with 20 minutes of daily exercise. Each week, the daily exercise is increased by 10 minutes. Write a function that represents the number of minutes of daily exercise in the  $n^{\text{th}}$  week?

$20 + 10x = y$