

For Algebra Prep  
Algebra 1 Study Guide 5.1 - 5.3

1. Write the formulas for the following:

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

slope-intercept form:  $y = mx + b$

point-slope form:  $y - y_1 = m(x - x_1)$

standard form:  $Ax + By = C$

2. Write an equation of the line in **slope-intercept form** containing the points (0, 3) and (6, 5). (Show work)

$$m = \frac{5-3}{6-0} = \frac{2}{6} = \frac{1}{3}$$

$x_1 y_1$     $x_2 y_2$

$$y = \frac{1}{3}x + 3$$

3. Write an equation, in **slope-intercept form**, that passes through point (-2, 3) with slope 4. (Show work)

$$\begin{aligned} y &= mx + b \\ 3 &= 4(-2) + b \\ 3 &= -8 + b \\ +8 & \quad +8 \\ 11 &= b \end{aligned}$$

$$y = 4x + 11$$

4. Write an equation of the line in **slope-intercept form** containing the points (4, -3) and (-16, 17). (Show work)

$$m = \frac{-3-17}{4-(-16)} = \frac{-20}{20} = -1$$

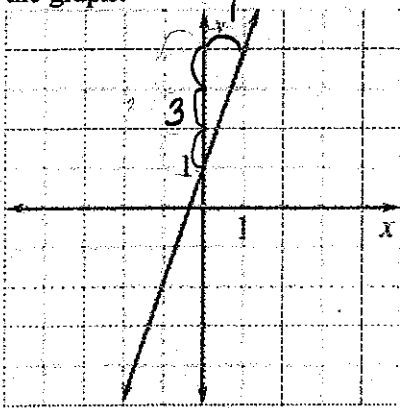
$x_2 y_2$     $x_1 y_1$

(4, -3)

$$\begin{aligned} y &= mx + b \\ -3 &= -1(4) + b \\ -3 &= -4 + b \\ +4 & \quad +4 \\ 1 &= b \end{aligned}$$

$$y = -1x + 1$$

5. Write an equation in slope-intercept form for the graph shown below. What are the slope and y-intercept of the graph?



$$(0, 1) \text{ y-int}$$

$$m = \frac{3}{1} \text{ (slope)}$$

$$y = 3x + 1$$

6. Write an equation, in point-slope form, of the line that passes through the point  $(4, 8)$  and has slope  $\frac{1}{2}$ . (No work necessary.)

$$y - 8 = \frac{1}{2}(x - 4)$$

7. Write an equation, in point-slope form, of the line that passes through the point  $(-7, -6)$  and has slope  $\frac{1}{2}$ . (No work necessary)

$$y - -6 = \frac{1}{2}(x - -7)$$

$$y + 6 = \frac{1}{2}(x + 7)$$

Write an equation in point-slope form of the line that passes through the given points. Then put it into slope-intercept form. (Show work)

8.  $(5, -7), m = \frac{3}{5}$

$$y + 7 = \frac{3}{5}(x - 5)$$

$$y + 7 = \frac{3}{5}x - 3$$

$$y = \frac{3}{5}x - 10$$

Write an equation in **point-slope form** of the line that passes through the given points. Then put it into **slope-intercept form**. (Show work)

9.  $(7, 2), (4, -4)$   
 $x_2, y_2 \quad x_1, y_1$

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

$$y - 2 = 2(x - 7) \quad \text{OR} \quad y + 4 = 2(x - 4)$$

$$y - 2 = 2x - 14$$

$$+2 \quad +2$$

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

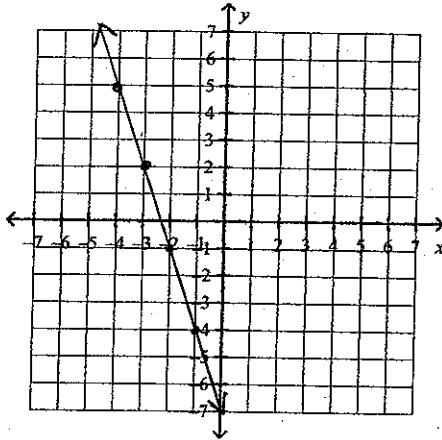
$$-4 \quad -4$$

$$y = 2x - 12 \quad y = 2x - 12$$

Graph the equation while keeping it in **point-slope form** and list the slope and the ordered pair that you used to graph the line.

10.  $y - 2 = -3(x + 3)$

Slope:  $-3$     Ordered pair:  $(-3, 2)$



Write an equation for the function in the form  $f(x) = mx + b$  or  $y = mx + b$

11.  $f(-2) = -18, f(0) = -2$

$(-2, -18) \quad (0, -2)$   
 $x_1, y_1 \quad x_2, y_2$

$$m = \frac{-2 - (-18)}{0 - (-2)} = \frac{16}{2} = 8$$

$$y = 8x - 2$$

12. The cost of a school banquet is \$70 for the set up plus \$13 for each person attending.
- a) Identify the independent variable and dependent variable (looking at the next step might help answer this).

The independent variable is number of people attending. ( $x$ )

The dependent variable is total cost. ( $y$ )

- b) Write an equation that gives total cost as a function of the number of people attending.

$$70 = b$$

$$13 = m$$

$$y = 13x + 70$$

- c) What is the cost for 90 people?

$$y = 13(90) + 70$$

$$y = 1240$$

The cost for 90 people to attend the banquet is \$1,240.

13. An editor gets a \$2100 raise each year. In her eighth year, she is making \$71,400 per year. Write an equation that gives her income as a function of how many years she has worked at the company.

$$m = 2100 \quad (8, 71,400)$$

$$71,400 = 2100(8) + b$$

$$71,400 = 16,800 + b$$

$$54,600 = b$$

$x$  = # of years

$y$  = income (\$)

$$y = 2100x + 54,600$$

How much should she be making after working at the company 5 years?

$$y = 2100(5) + 54,600$$

$$y = 10,500 + 54,600$$

$$y = 65,100$$

The editor will be making \$65,100 after 5 years at the company.