

### Linear Equations Test Reivew

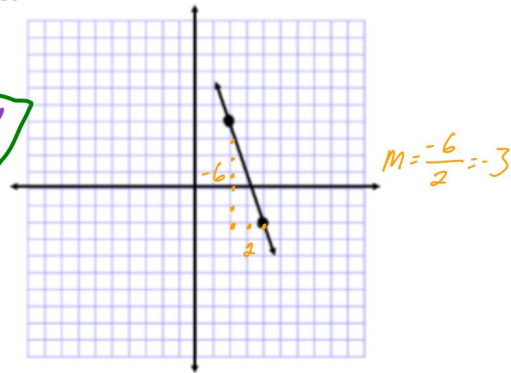
Topics:

- Rate of Change and Slope  $\rightarrow m = \frac{y_2 - y_1}{x_2 - x_1}$
- XY Intercepts
- Graphing Equations
  - Slope-Intercept Form  $y = mx + b$
  - Standard Form  $Ax + By = C$
  - Point-Slope Form  $y - y_1 = m(x - x_1)$
  - Vertical Lines  $x =$
  - Horizontal Lines  $y =$
- Writing Equations
  - SI, PS, SF forms
- Converting between the three forms
- Parallel and Perpendicular Lines

$\hookrightarrow$  same slope       $\hookrightarrow$  opposite, reciprocal slopes

Part I. Find the slope of each line between the two points.

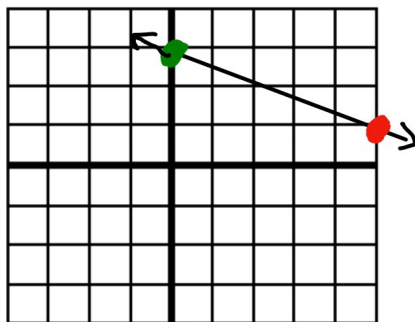
1. (4, 5) and (4, -2)  $\frac{-2 - 5}{4 - 4} = \frac{-7}{0} \rightarrow$  undefined



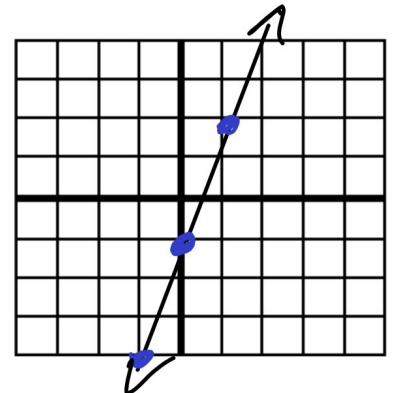
3. (5, 7) and (-3, 8)  $\frac{8 - 7}{-3 - 5} = \frac{1}{-8} = -\frac{1}{8}$

Part II. Find the slope and y-intercept, then graph.

4.  $2x + 5y = 15$   
 $m = -\frac{2}{5}$   
 $b = 3$



5.  $y = 3x - 1$   
 $m = 3 = \frac{3}{1}$   
 $b = -1$



Part IV. Write the equation of the line, given:

8. slope =  $\frac{2}{3}$       y-intercept = -3  
 $m$                        $b$

$y = \frac{2}{3}x - 3$

9. x-intercept = -4      y-intercept = 5  
 $(-4, 0)$                        $(0, 5)$

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

$y = \frac{5}{4}x + 5$

Part V. Write the equation of the line in point-slope form that goes through the following point with the given slope.

10.  $m = -3$  (12, -7)

$$y + 7 = -3(x - 12)$$

Part VI. Write the equation of the line that goes through the two points, in slope-intercept form.

11. (-2, 6) and (4, 9)  $m = \frac{9-6}{4-2} = \frac{3}{2} = \frac{1}{2}$  12. (1, 3) and (2, -5)  $m = \frac{-5-3}{2-1} = \frac{-8}{1} = -8$

$$y - 9 = \frac{1}{2}(x - 4)$$

$$y - 9 = \frac{1}{2}x - 2 \rightarrow y = \frac{1}{2}x + 7$$

$$y - 3 = -8(x - 1)$$

$$y - 3 = -8x + 8$$

$$y = -8x + 11$$

Part VII. Write the equation for the line in slope-intercept form that is parallel to the given line and passes through the given point.

13.  $y = -4x + 7$  through (1, -12)

$$m = -4$$

$$x_1 = 1$$

$$y_1 = -12$$

$$y + 12 = -4(x - 1)$$

$$y + 12 = -4x + 4$$

$$y = -4x - 8$$

Part VIII. Write the equation of the line in slope intercept form that is perpendicular to the given line and contains the given point.

14.  $y = -\frac{3}{5}x + 5$  through (9, 1)

$$m = \frac{5}{3}$$

$$x_1 = 9$$

$$y_1 = 1$$

$$y - 1 = \frac{5}{3}(x - 9)$$

$$y - 1 = \frac{5}{3}x - 15$$

$$y = \frac{5}{3}x - 14$$

Part IX. Follow the directions for each question.

15. Change  $y + 7 = \frac{3}{4}(x - 8)$  into:

$$y + 7 = \frac{3}{4}x - 6$$

a. Slope-intercept form:

$$y = \frac{3}{4}x - 13$$

b. Standard form

$$[-\frac{3}{4}x + y = -13] \times -4$$

$$3x - 4y = 52$$

16. The cost of summer school is \$50 plus \$100 per class. Let  $C = \text{cost}$ ,  $x = \# \text{ of class}$

a. Write an equation that illustrates this situation:

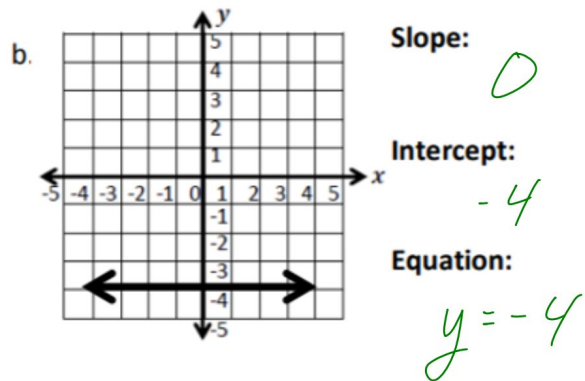
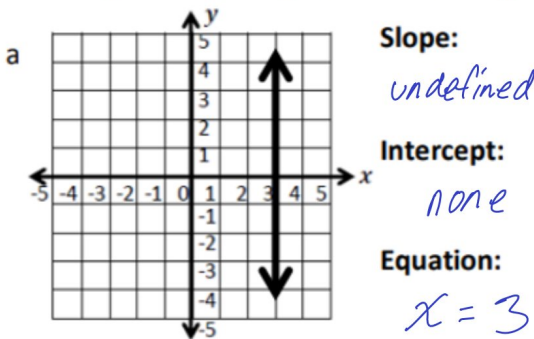
$$C = 100x + 50$$

b. What is the cost for attending 4 classes?

$$100(4) + 50$$

$$C = 4450$$

State the slope and intercept of the following lines and write the equation for each.



Find  $r$  for which the points  $(r, 27)$  and  $(5, 6)$  have a slope of  $\frac{2}{3}$ .

$x_1 \ y_1 \ x_2 \ y_2 \ m$

$$\Rightarrow \frac{2}{3} = \frac{6 - 27}{5 - r}$$

$$\Rightarrow \frac{2}{3} = \frac{-21}{5 - r}$$

$$2(5 - r) = 3(-21)$$

$$\rightarrow 2(5 - r) = 3(-21)$$

$$\frac{10 - 2r}{-10} = \frac{-63}{-10}$$

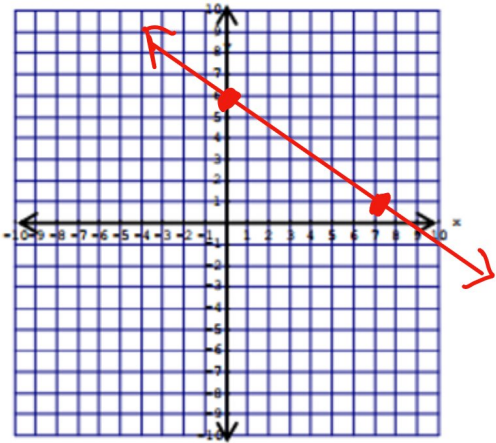
$$\frac{-2r}{-2} = \frac{-73}{-2}$$

$$r = \frac{73}{2}$$

Graph each equation:

$$y = -\frac{5}{7}x + 6$$

*y-int: 6*  
*slope:  $-\frac{5}{7}$*

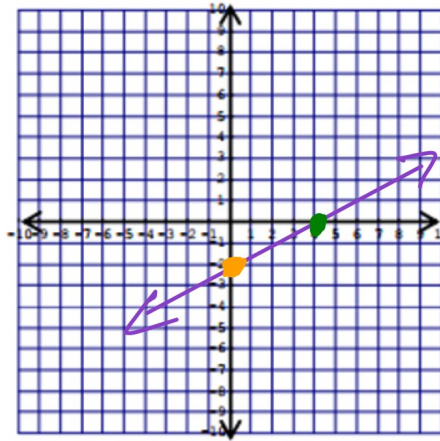


$$2x - 4y = 8$$

*x-int*  
 $\frac{2x}{2} = 8$

*x = 4*

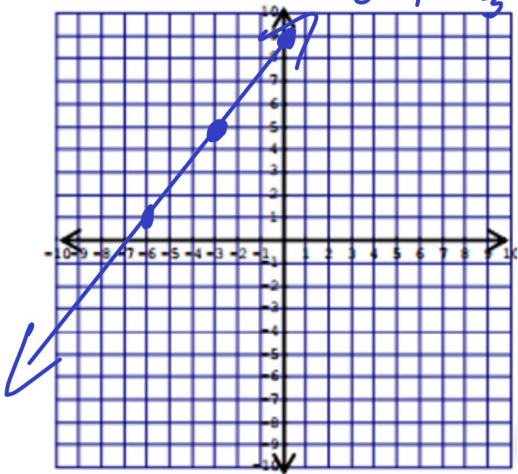
*(4, 0)*



*y-int*  
 $-4y = 8$   
 $y = -2$   
*(0, -2)*

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

*point: (-3, 5)*  
*slope:  $\frac{4}{3}$*



*x = -4* *vertical at -4*

