

writing equations of a linear function

$$y = mx + b \quad \text{slope intercept form}$$

$$Ax + By = C \quad \text{intercepts form}$$

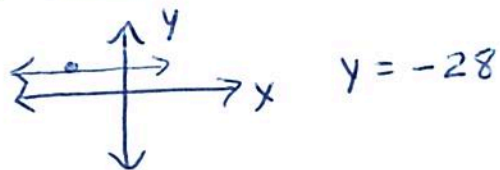
$$y - y_1 = m(x - x_1) \quad \text{point-slope form}$$

write the equation of a line that is:

- parallel to the x-axis and goes through $(-28, 45)$
- perpendicular to the function $3y - 6x = 12$
and has the same y-intercept as $9x - 2y = 12$
- the y-axis
- parallel to the y-axis and goes through $(1, 3)$
- perpendicular to the y-axis and
goes through $(-90, 5)$
- goes through $(-10, 5)$ and $(-14, 7)$
- parallel to the function $10y - 6x = 20$
and has an x-intercept of 15.
- in point slope form, write the equation of
a line parallel to $2y - 5 = 3x$ and goes
through $(-8, 5)$
- in slope intercept form, write the equation
of the line that goes through $(-10, 7)$ and $(-11, 4)$

extra linear functions practice sheet

a) draw a picture!



b) \perp to $3y - 6x = 12$
 $3y = 6x + 12$
 $y = 2x + 12$

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

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

same y intercept

$$9x - 2y = 12$$

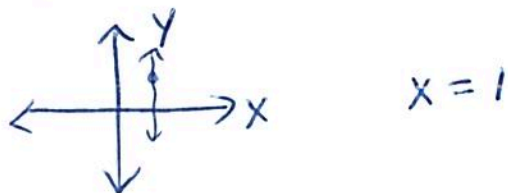
$$-2y = -9x + 12$$

$$y = \frac{9}{2}x - 6$$

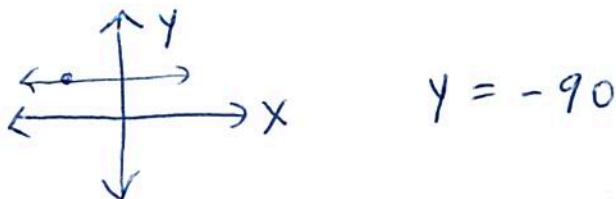
$$b = -6$$

c) vertical line $\rightarrow x = 0$

d) draw a picture



e) \perp to y-axis



f) $\begin{matrix} x_1 & y_1 & x_2 & y_2 \\ (-10, 5) & & (-14, 7) & \end{matrix}$

$$\text{slope} = \frac{\Delta y}{\Delta x} = \frac{7-5}{-14-(-10)} = \frac{2}{-4} = -\frac{1}{2}$$

y intercept

$$y = mx + b$$

$$5 = -\frac{1}{2}(-10) + b$$

$$5 = 5 + b$$

$$b = 0$$

$$y = -\frac{1}{2}x$$

or point-slope form

$$y - 5 = -\frac{1}{2}(x + 10)$$

$$y - 7 = -\frac{1}{2}(x + 14)$$

g) parallel to $10y - 6x = 20$

$$10y = 6x + 20$$

$$y = \frac{6}{10}x + 2$$

$$y = \frac{3}{5}x + 2$$

$$\text{slope} = \frac{3}{5}$$

x-intercept

$$(15, 0)$$

$$y = mx + b$$

$$0 = \frac{3}{5}(15) + b$$

$$0 = 9 + b$$

$$b = -9$$

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

h) parallel to $2y - 5 = 3x$

$$2y = 3x - 5$$

$$y = \frac{3}{2}x - \frac{5}{2}$$

$$\text{slope} = \frac{3}{2}$$

point $(-8, 5)$

$$y - 5 = \frac{3}{2}(x + 8)$$

i) $(-10, 7)$ $(-11, 4)$

$$\frac{\Delta y}{\Delta x} = \frac{7 - 4}{-10 - (-11)} = \frac{3}{1} = 3$$

y-intercept

$$y = mx + b$$

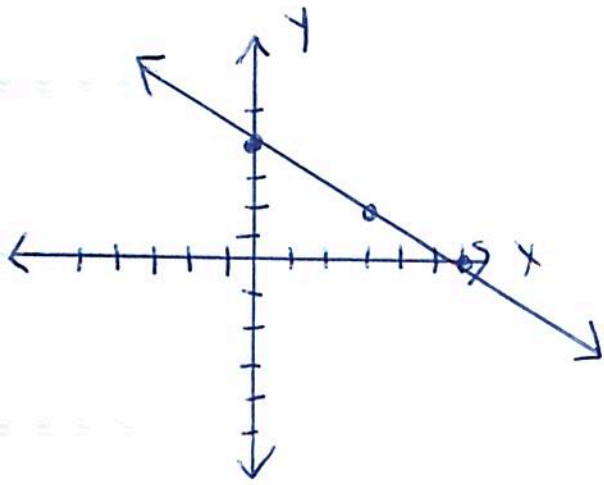
$$7 = 3(-10) + b$$

$$7 = -30 + b$$

$$37 = b$$

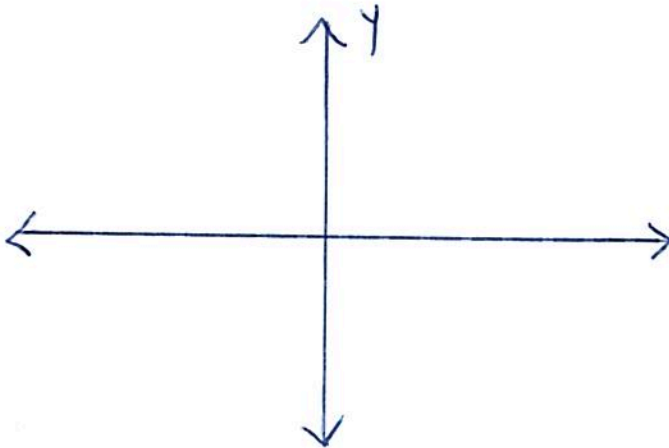
$$y = 3x + 37$$

graphing



1) write the equation of this graph in point-slope form

2) graph the function $y + 6 = -2(x - 5)$



graphing

1) points on graph $(0,4)$ $(3,2)$ $(6,0)$ $\frac{\text{rise}}{\text{run}} = -\frac{2}{3}$

point slope form:

$$y - 4 = -\frac{2}{3}x$$

$$\text{or } y - 2 = -\frac{2}{3}(x - 3)$$

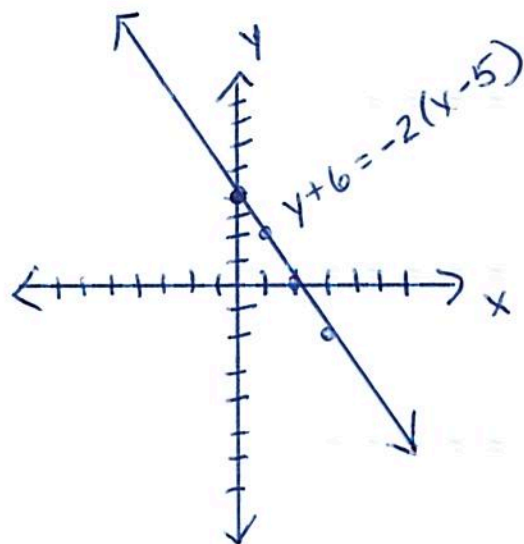
$$\text{or } y = -\frac{2}{3}(x - 6)$$

2) graph $y + 6 = -2(x - 5)$

$$y + 6 = -2x + 10$$

$$y = -2x + 4$$

$$\text{slope} = -\frac{2}{1} \quad b = 4$$



additional practice items

3) solve for q if the slope of the line containing points $(-3, 5)$ and $(q, 8)$ is $\frac{1}{3}$

4) Is the point $(-16, 4)$ a solution to $2y = x - 36$?

$$3) \quad m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{1}{3} = \frac{5 - 8}{-3 - q}$$

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

$$-q = -3 - q$$

$$-6 = -q$$

$$q = 6 \quad (-3, 5)(6, 8)$$

check
does

$$\frac{1}{3} = \frac{5 - 8}{-3 - 6}$$

$$\frac{1}{3} = \frac{-3}{-9} \quad \checkmark$$

$$4) \quad 2y = x - 36$$

$\begin{matrix} x & y \\ (-16, & 4) \end{matrix}$

$$2(4) = -16 - 36$$

$$8 \neq -52$$

The point is not on the line
(not a solution)
because it did not make the equation true.