Create an "x, y table" of solutions, including x and y intercepts, and graph the equation:

$$y = \frac{2}{3}x + 1$$

$y = \frac{2}{3}x + 1$

$0 = \frac{2}{3}x + 1$

$-1 \quad -1$

$\frac{3}{2} \cdot -1 = \frac{2}{3}x \cdot \frac{3}{2}$

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

$y = \frac{2}{3}x + 1$

$y = \frac{2}{3} \cdot 0 + 1$

$y = 1$

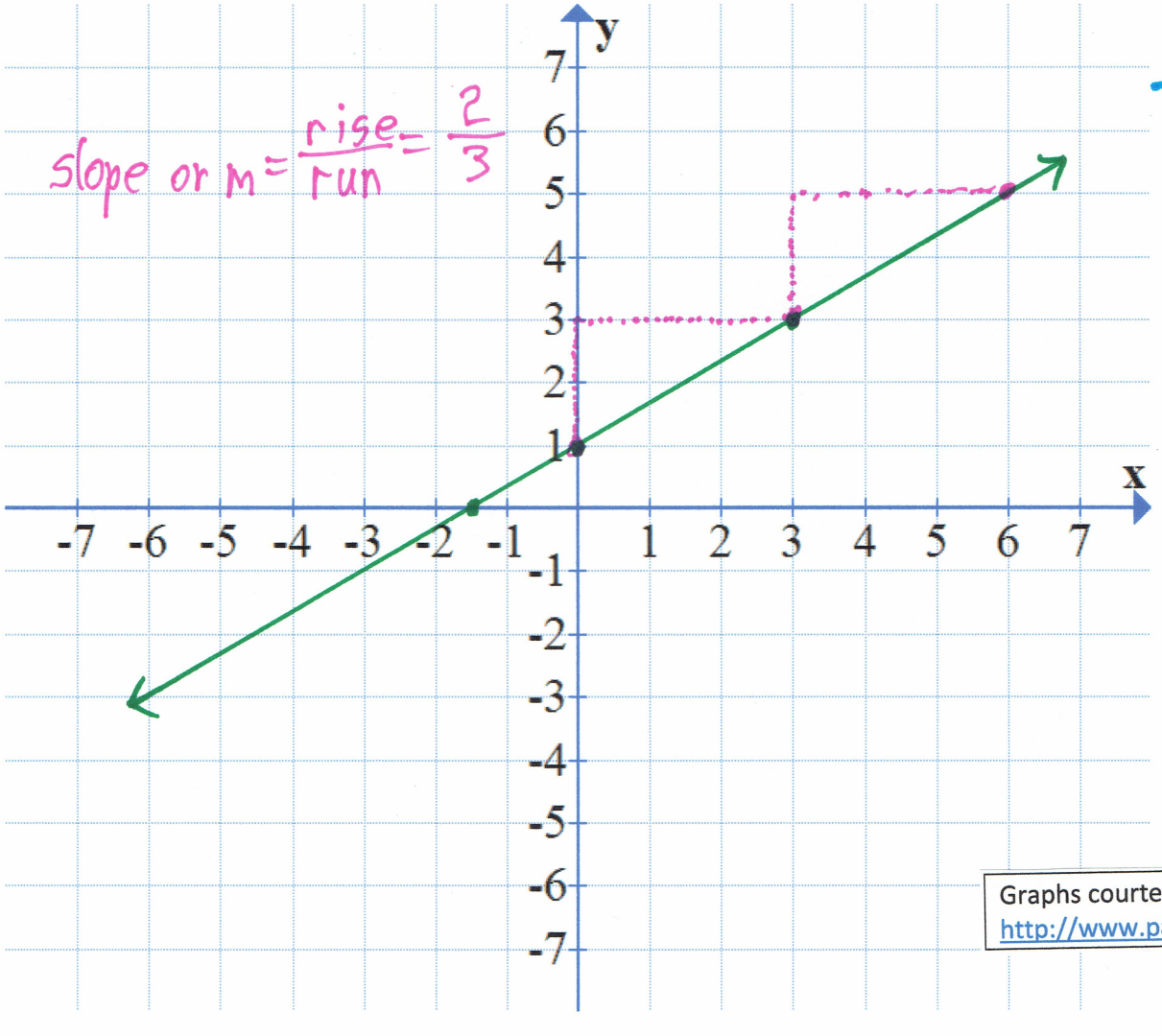
$y = \frac{2}{3}x + 1$

$y = \frac{2}{3} \cdot 3 + 1$

$y = 2 + 1$

$y = 3$

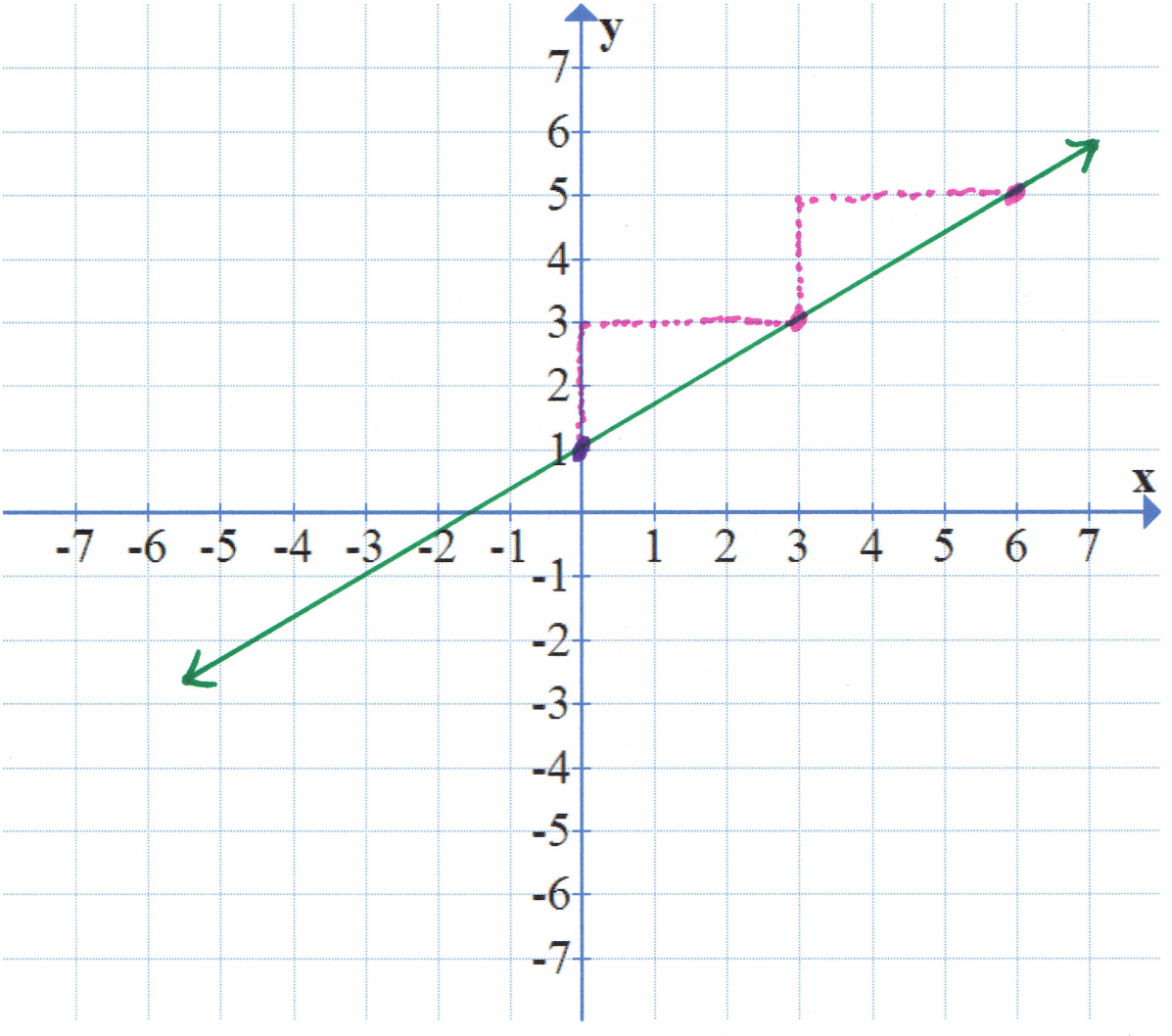
x	y
$-\frac{3}{2}$	0
0	1
3	3



Graphs courtesy of "Graph": http://www.padowan.dk

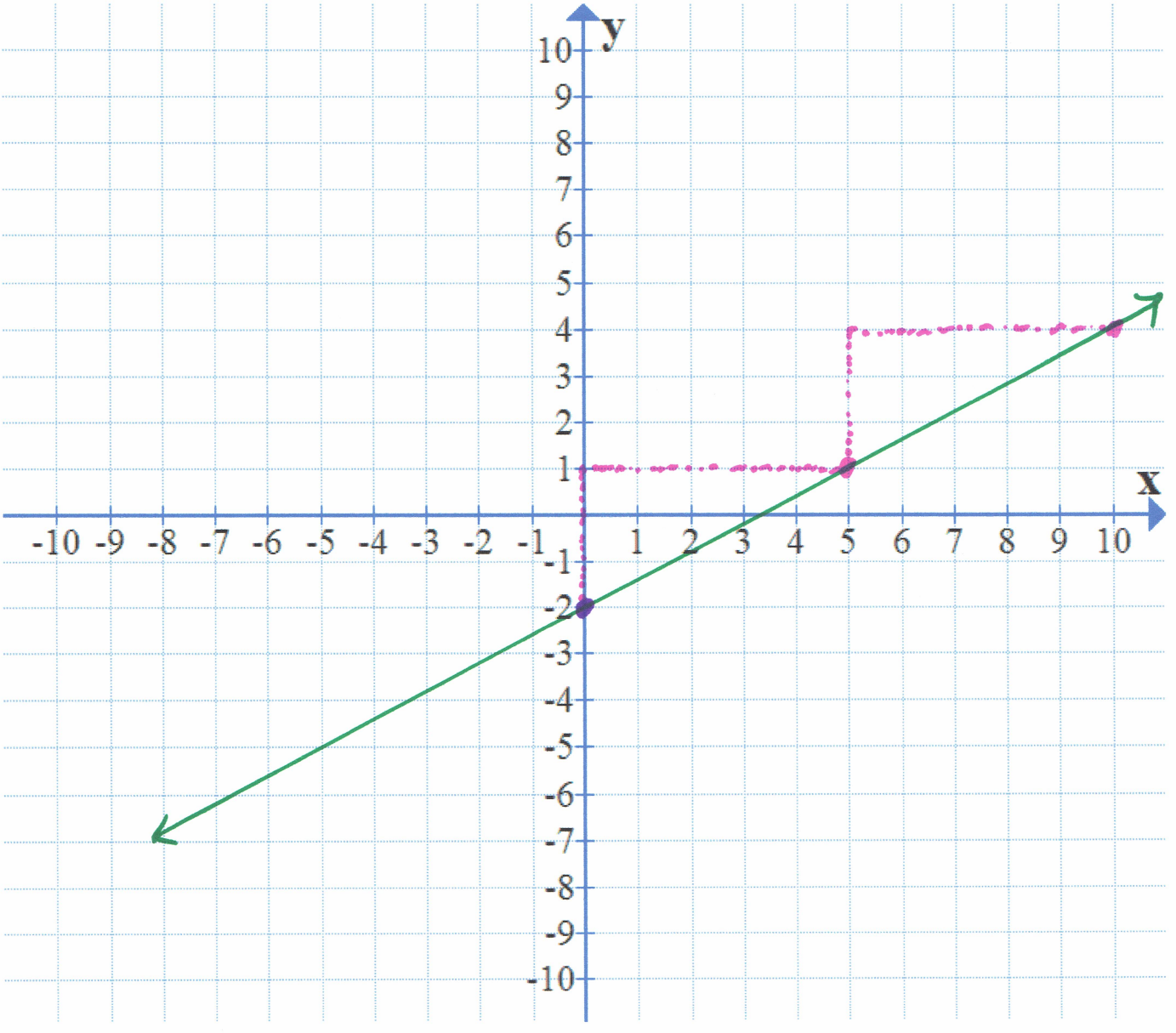
This equation is in slope-intercept form, so named because this is the slope, and this is the y-intercept (when x is 0).

$$y = \frac{2}{3}x + 1$$



Graph the equation, which is written in slope-intercept form.

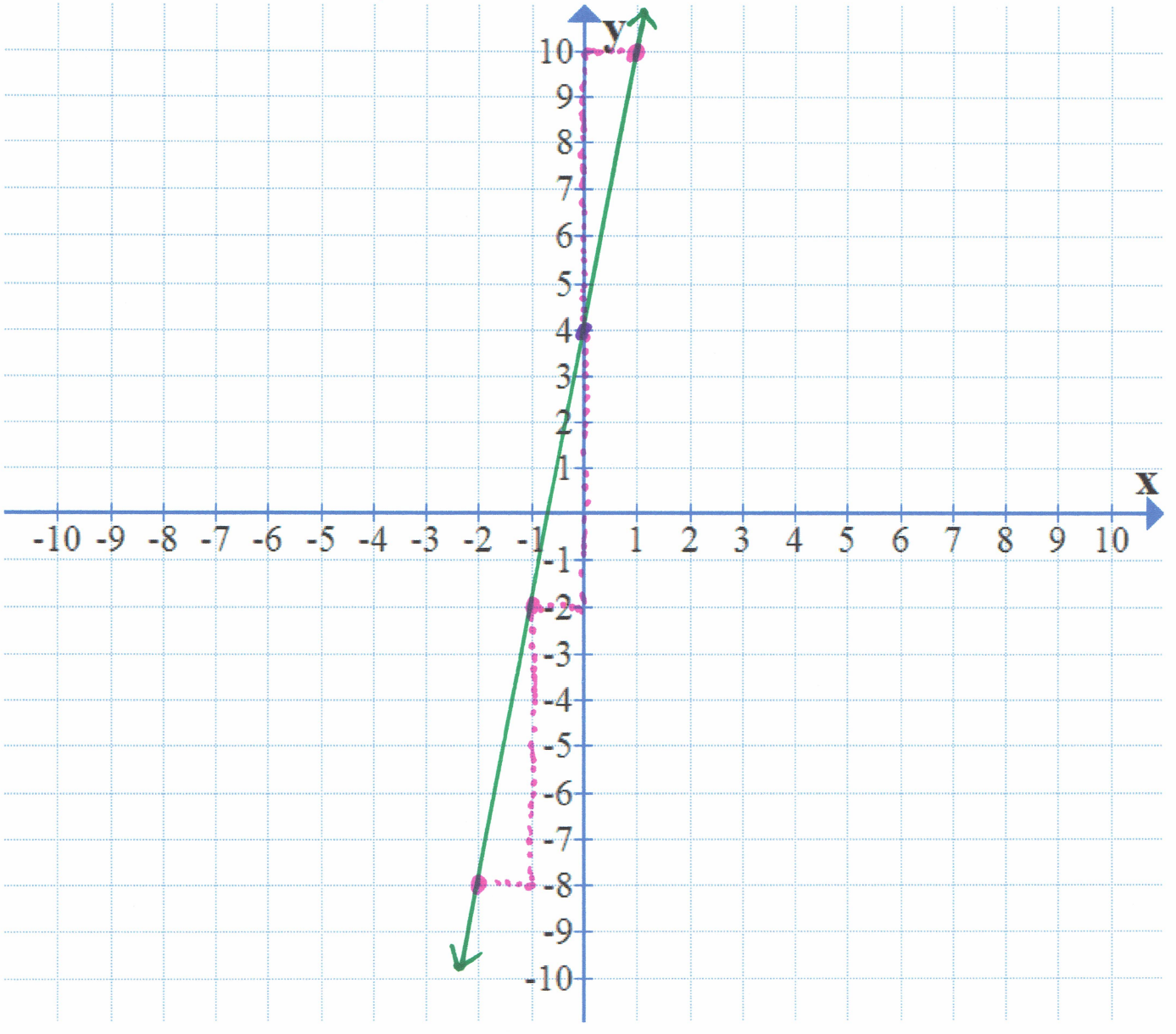
$$y = \frac{3}{5}x - 2$$



Graph the equation, which is written in slope-intercept form.

$$y = \frac{6}{1}x + 4$$

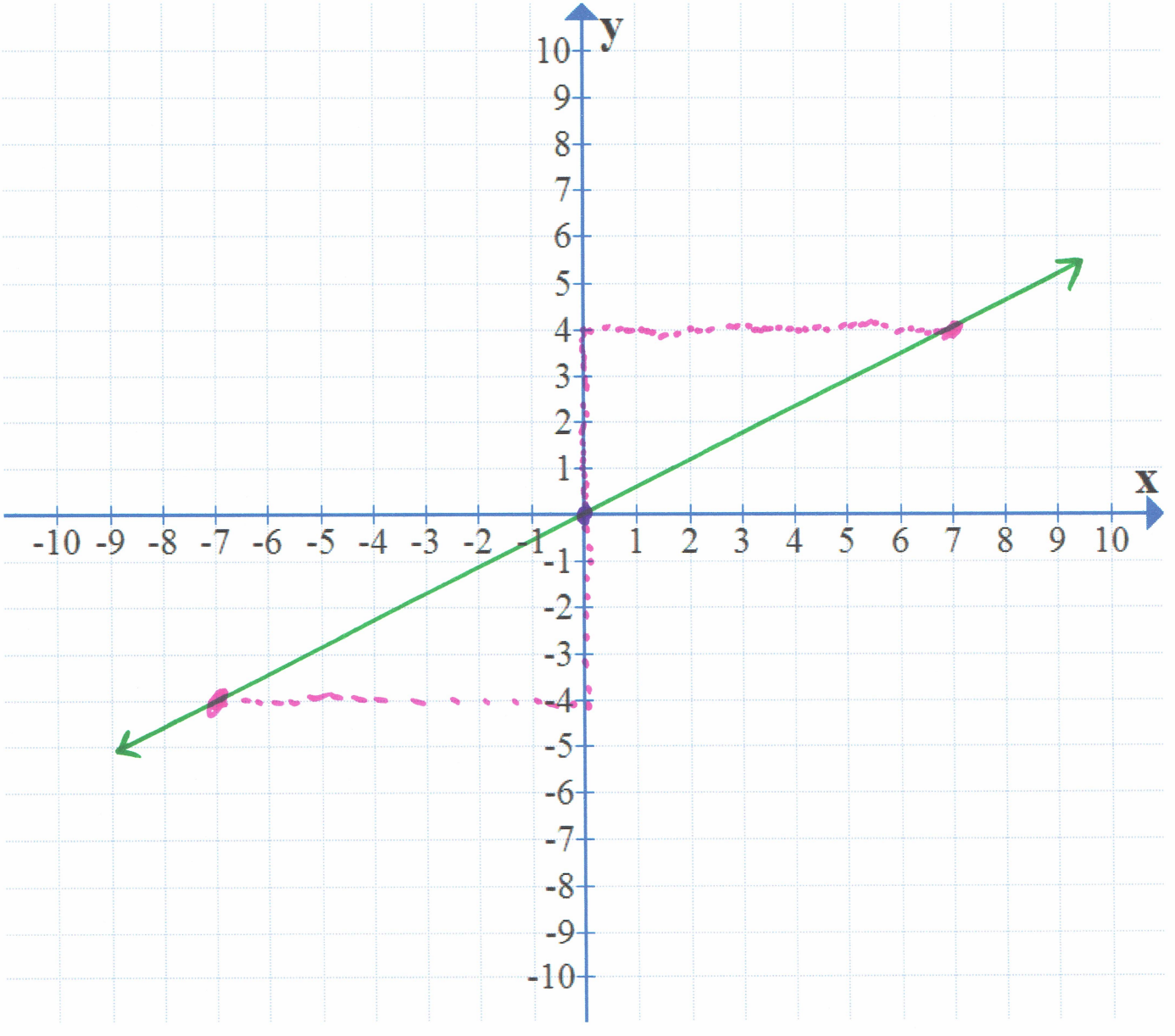
$$\frac{-6}{-1}$$



Graph the equation, which is written in slope-intercept form.

$$y = \frac{4}{7}x$$

$\frac{-4}{-7}$



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

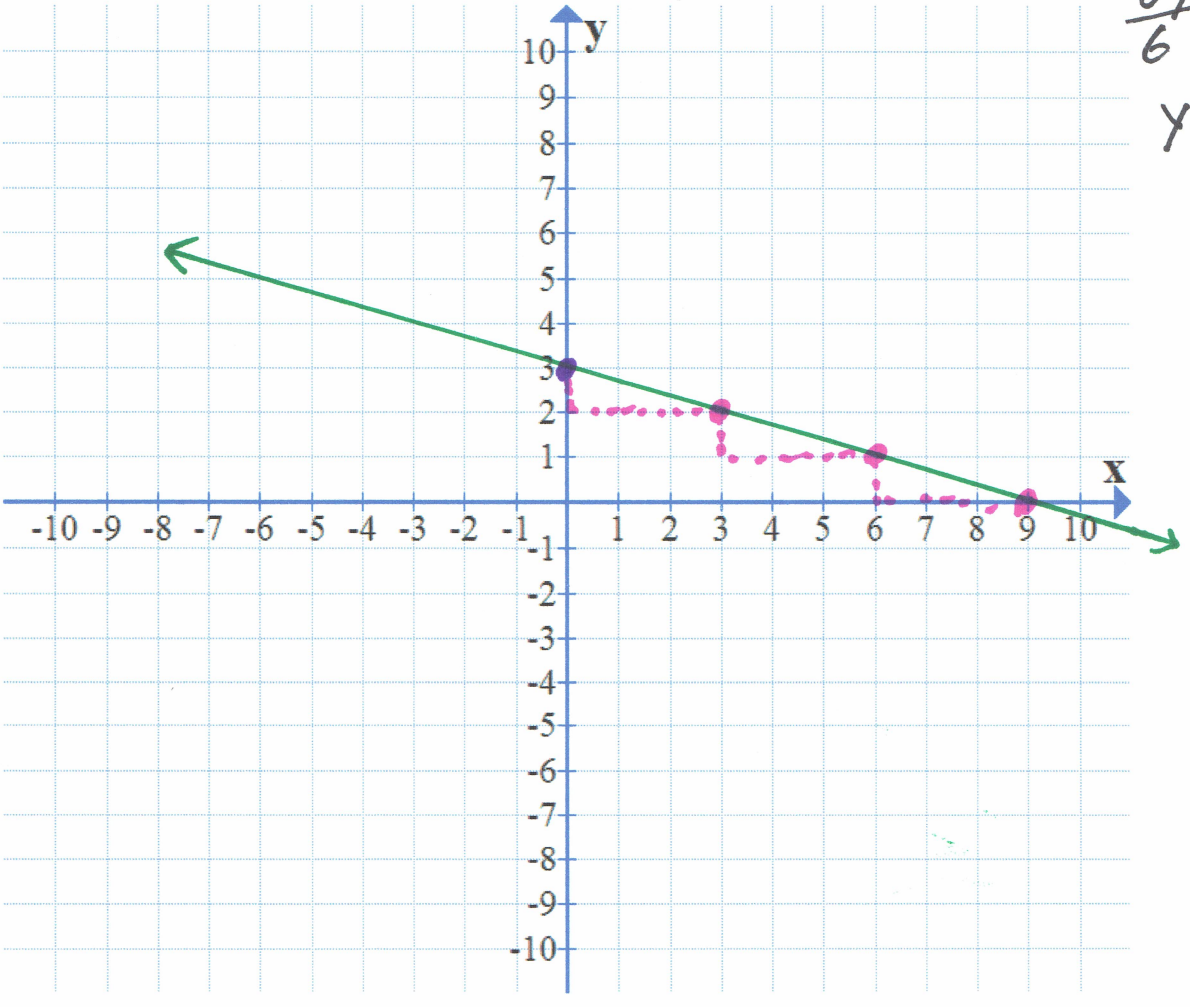
Examples: $y = \frac{2}{7}x - 3$, $y = -9x + 4$, $y = \frac{2}{5}x$

Standard form: $Ax + By = C$

Examples: $2x + 6y = 18$ $5x - 3y = 7$ $8x + y = -10$

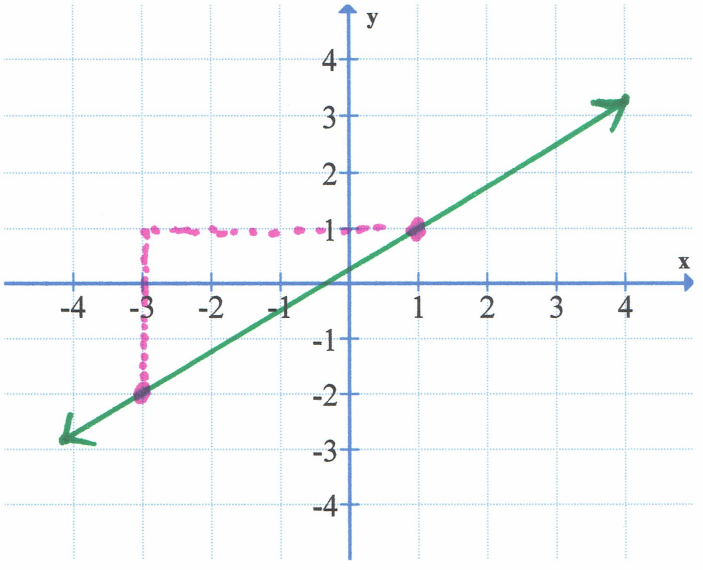
Write the equation in slope-intercept form and graph it.

$$2x + 6y = 18$$
$$-2x \qquad -2x$$
$$\frac{6y}{6} = \frac{-2x}{6} + \frac{18}{6}$$
$$y = -\frac{1}{3}x + 3$$



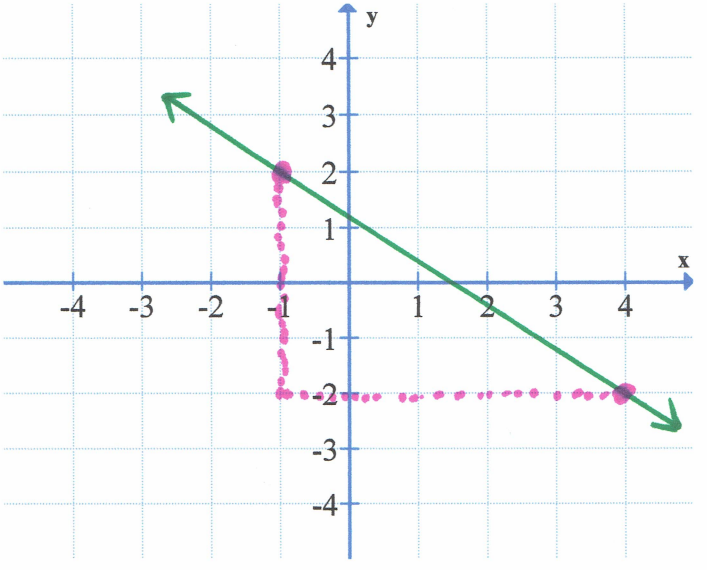
Positive Slope

$$m = \frac{\text{rise}}{\text{run}} = \frac{3}{4}$$



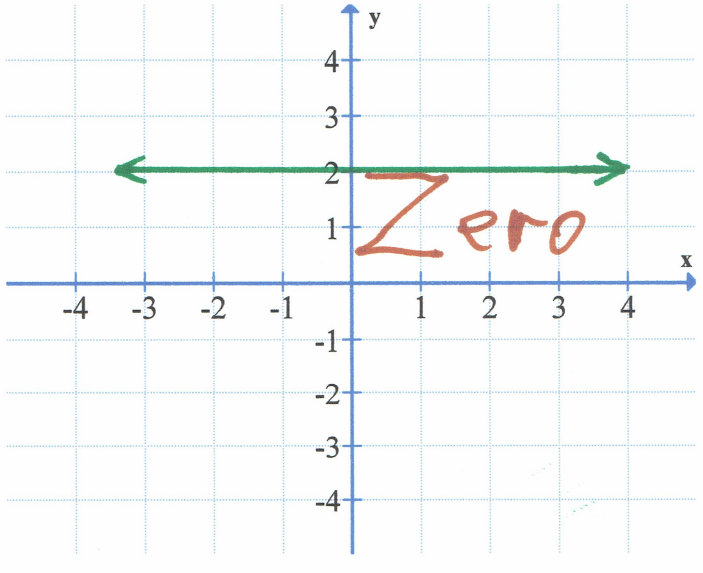
Negative Slope

$$m = \frac{\text{rise}}{\text{run}} = \frac{-4}{5} = \frac{4}{-5} = -\frac{4}{5}$$



Slope is zero.

$$m = \frac{\text{rise}}{\text{run}} = \frac{0}{\infty} = 0$$

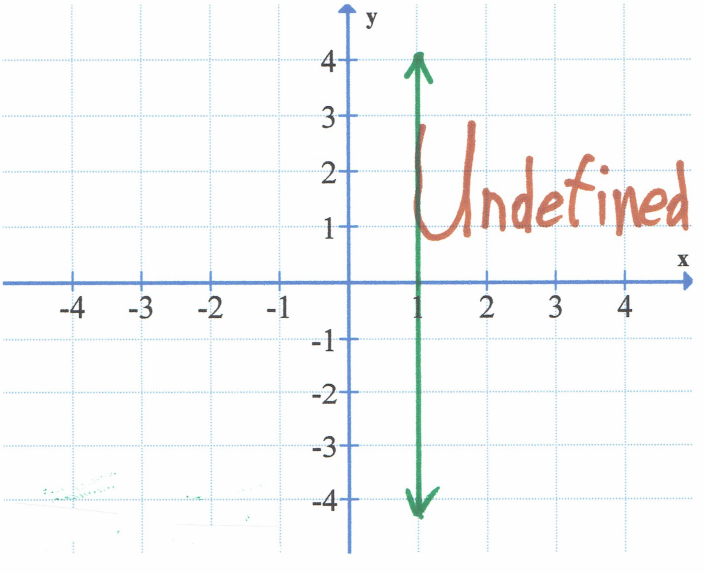


horizontal line

Slope is undefined.

(also termed no slope)

$$m = \frac{\text{rise}}{\text{run}} = \frac{\infty}{0} = \text{undefined}$$

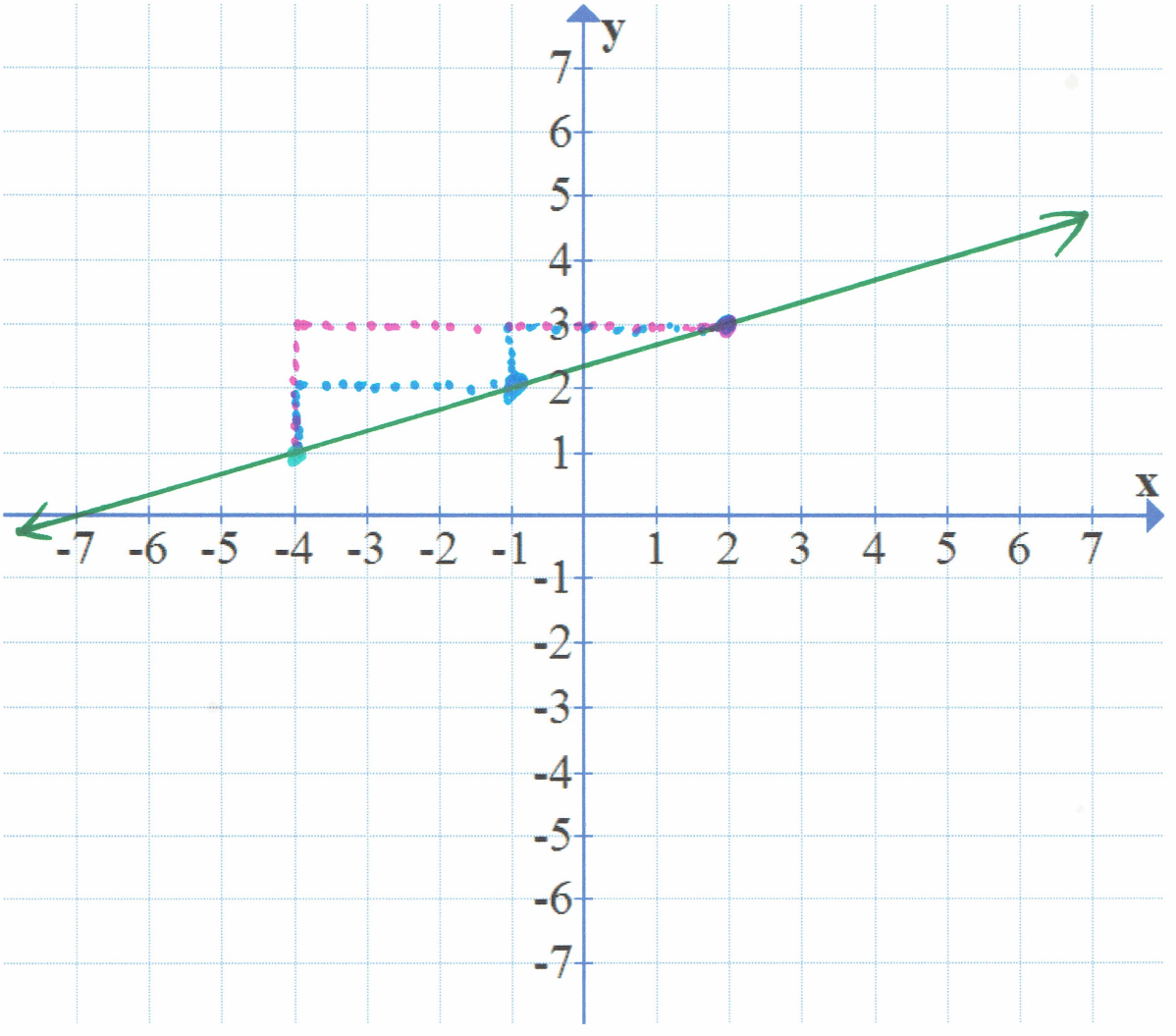


vertical line

Given two points, find the slope. $(-4, 1)$, $(2, 3)$ x_1 y_1 x_2 y_2

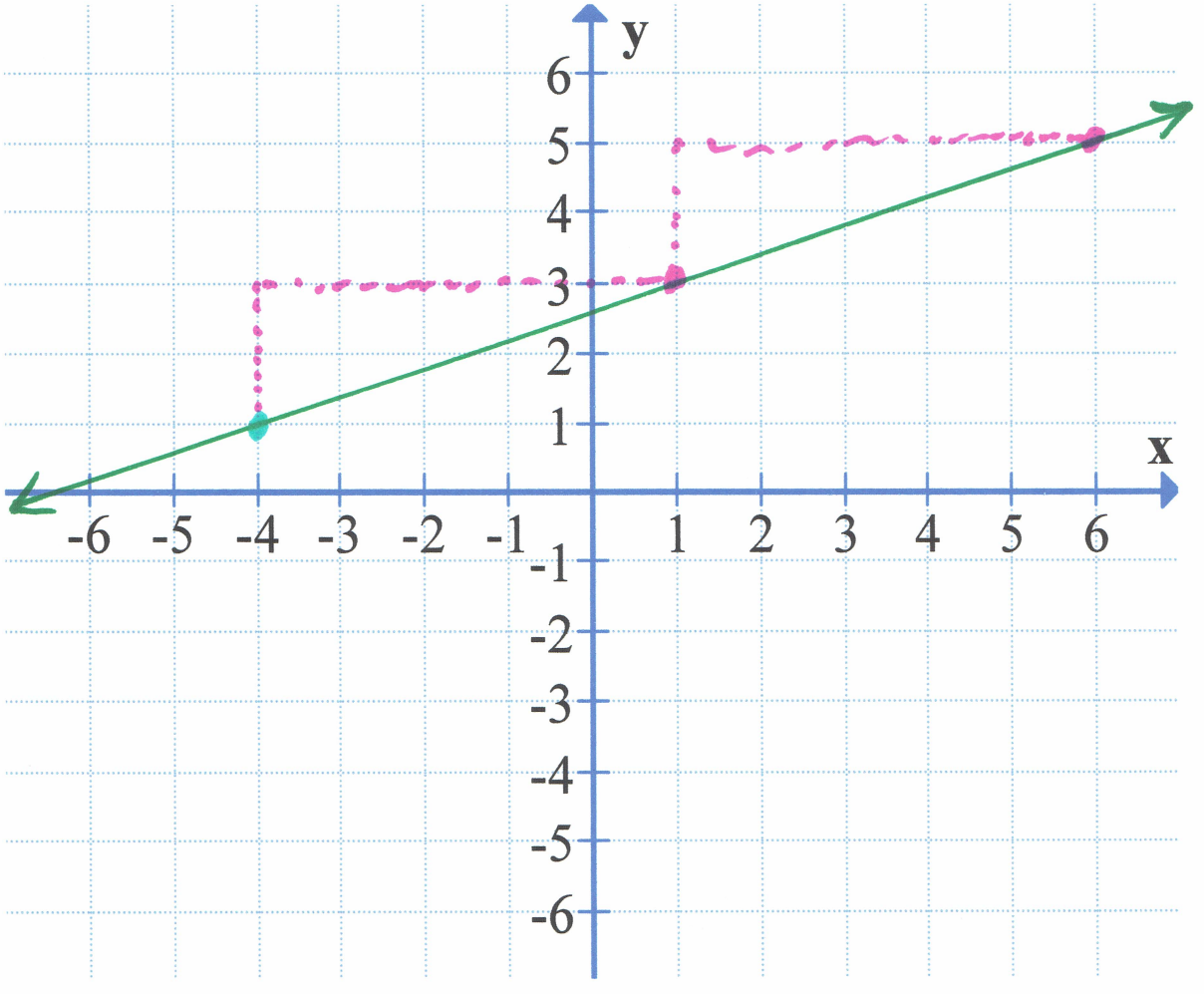
Use the slope formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{\text{rise}}{\text{run}} = \frac{2}{6} = \frac{1}{3}$ $\frac{3-1}{2-(-4)} = \frac{2}{2+4} = \frac{2}{6} = \frac{1}{3}$



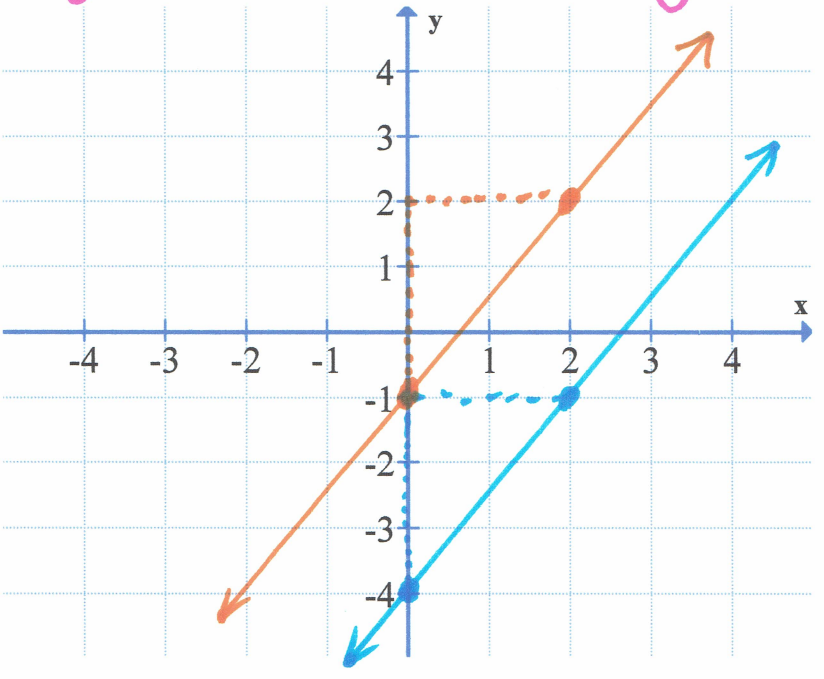
Given a point and a slope, you can graph the line.

$$(-4, 1) \qquad m = \frac{2}{5}$$



parallel lines — slope is same

$y = \frac{3}{2}x - 4$ $y = \frac{3}{2}x - 1$



perpendicular lines — slope is negative reciprocal

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