

objective: To graph and write equations in point-slope form.

Recap:

1.) Standard form: $Ax + By = C$

ways to graph: x-y intercept method

re-write in slope-intercept form.

2.) slope-intercept form: $y = mx + b$

ways to graph: plot y-intercept (b) on y-axis then plot second point using the slope ($\frac{\text{rise}}{\text{run}}$).

New 3.) Point slope form:

* use opposite signs to find (x_1, y_1) .

point: (x_1, y_1)
slope: m

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

I.) To graph method 1

1.) plot point (x_1, y_1)

2.) from (x_1, y_1) plot a second point using

$$m = \text{slope} = \frac{\text{rise}}{\text{run}}$$

3.) connect to create line

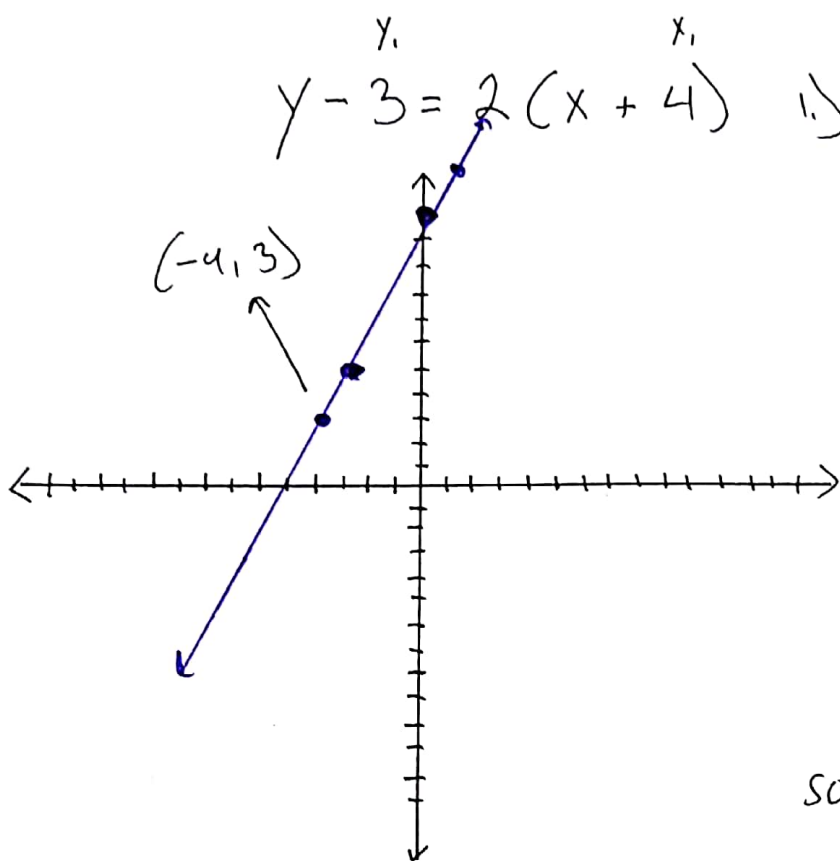
To graph method 2

re-write in slope-intercept form.

Solve for y .

$$y = mx + b$$

Example: Graph the line in point-slope form



$y - 3 = 2(x + 4)$

Method 1

1.) Identify point (x_1, y_1)
 $(-4, 3)$
 and plot on graph

2.) Plot a second point
 using slope = $\frac{2}{1}$

3.) connect to create line

Method 2

solve for y for $y = mx + b$

$$y - 3 = 2(x + 4)$$

$$y - 3 = 2x + 8$$

$$+3 \quad +3$$

$y = 2x + 11$

plot y-intercept: $(0, 11)$

plot point using slope = $\frac{2}{1}$

I write an equation of a line in point slope form given two points

$(3, 2), (1, 4)$ $m = \frac{y_2 - y_1}{x_2 - x_1}$

$y - 2 = -1(x - 3)$ 1.) Find slope

point: $(3, 2)$ $m = \frac{4 - 2}{1 - 3} = \frac{2}{-2} = -1$

slope: $m = -1$

2.) use only 1 point from the 2 given. you choose.

I choose $(3, 2)$.

3.) put into correct form

III. write an equation of a line in point-slope form that passes through the given point and has the given slope.

- use the correct form: $y - y_1 = m(x - x_1)$
to plug in given point: (x_1, y_1) (careful for your signs)
- use the given slope to plug in for m .

Example: $(x_1, y_1) = (2, 7)$
 $m = -4$

$$\boxed{y - 7 = -4(x - 2)}$$

IV. Write an equation in point-slope form from the given line. Choose the right point for (x_1, y_1) .

