

Notes

Target 4-3 Point-Slope Form

Algebra 1
12-6-13

Forms:

Standard: $ax + by = c$
 Slope intercept: $y = mx + b$
 $2x + 3y = 6$
 $y = \frac{2}{3}x - 2$

Point-slope form
 $y - y_1 = m(x - x_1)$
 Given: (x_1, y_1)
 this y never changes
 this x never changes

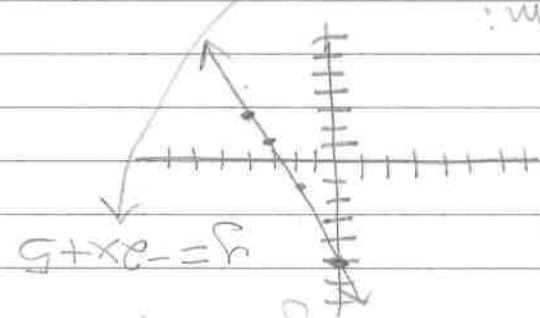
one point + slope
 1. substitute in
 m, x_1, y_1
 2. simplify as needed

two points
 1. find slope
 2. pick a point
 3. plug in

One point + slope:

① Write the point-slope form of an equation for a line that passes through $(4, -3)$ with a slope of -2 .

$m = -2$
 $x_1 = 4$
 $y_1 = -3$
 $y - (-3) = -2(x - 4)$
 $y + 3 = -2x + 8$
 $y + 3 = -2x + 4$
 to put in slope-int form:



$y = -2x + 5$

② passes through $(-2, 0)$ slope $-\frac{2}{3}$

$m = -\frac{2}{3}$
 $x_1 = -2$
 $y_1 = 0$
 $y - y_1 = m(x - x_1)$
 $y - 0 = -\frac{2}{3}(x - (-2))$
 $y = -\frac{2}{3}(x + 2)$

Slope-int form:
 $y = -\frac{2}{3}(x + 2)$
 $y = -\frac{2}{3}x - \frac{4}{3}$

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

slope-int: $y = mx + b$

standard: $ax + by = c$

3. Write an equation in point-slope, then slope-int:

point $(-3, 2)$ slope of 4

$$m = 4 \quad x_1 = -3 \quad y_1 = 2$$

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

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

point-slope

$$y - 2 = 4x + 12$$

$$y = 4x + 14$$

slope-int

4. Write an equation in point-slope form that goes through $(-2, -7)$ and $(-5, -10)$

x_1, y_1 x_2, y_2

$$m = \frac{-7 - (-10)}{-2 - (-5)} = \frac{-7 + 10}{-2 + 5} = \frac{3}{3} = 1$$

$$m = 1 \quad x_1 = -2 \quad y_1 = -7$$

$$y - y_1 = m(x - x_1)$$

$$y - (-7) = 1(x - (-2))$$

$$y + 7 = x + 2$$

$$y = x - 5$$

5. goes through $(2, 4)$ and $(-1, 2)$

x_1, y_1 x_2, y_2

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

$$m = \frac{2}{3} \quad x_1 = 2 \quad y_1 = 4$$

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

$$y - 4 = \frac{2}{3}x - \frac{4}{3} \rightarrow -\frac{2}{3}x + 4 = -\frac{4}{3} + 4 = -\frac{4}{3} + \frac{12}{3} = \frac{8}{3}$$

$$y = \frac{2}{3}x + \frac{8}{3}$$

6 Suppose you receive \$100 for a graduation present & you deposit it in a savings account & received no interest. Then by week 20 you have \$200. Write an equation in point-slope form that represents the data.



$$m = \frac{200 - 100}{20 - 0} = \frac{100}{20} = 5$$

$$m = 5 \quad x_1 = 0 \quad y_1 = 100$$

$$y - y_1 = m(x - x_1)$$

$$y - 100 = 5(x - 0)$$

$$y - 100 = 5x$$

$$+ 100 \quad + 100$$

$$y = 5x + 100$$

7 M. is spending \$ at avg. rate of \$3 per day. After 14 days, she has \$68 left. The amount left depends on # of days that have passed. Write an equation in point-slope form that represents the situation.

$$m = -\frac{\$3}{\text{day}} \quad (14, 68)$$

$$y - y_1 = m(x - x_1)$$

$$y - 68 = -3(x - 14)$$

$$y - 68 = -3x + 42$$

$$+ 68 \quad + 68$$

$$y = -3x + 110$$

slope-int

