Algebra 1

Chapter 5

Section 5-4

May 13-10:02 PM

Slope Quick Quiz

$\frac{3-0}{9-1}=\frac{3}{8}$

- Find the slope between points: (9, 3) and (1, 0)
- Write the equation of a line with a slope of 5 and a y-intercept of -7.5.

$y=mx+b$ $y=5x+(-7.5)$

- Variables x and y are in direct variation. When x = 8, y = 12. Find the constant of variation.

$y=kx$

$\frac{12}{8}=\frac{k\cdot 8}{8}$

$k=\frac{6}{4}=\frac{3}{2}$

$k=\frac{3}{2}$

Nov 4-1:12 PM

Review

$$\text{slope} = \frac{\text{change in y}}{\text{change in x}} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

Direct Variation: $y = kx$ (goes through (0,0); k is slope)

Slope-intercept form: $y = mx + b$ (m: slope; b: y-int)

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Point-slope form

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

Uses a point → (x_1, y_1)

and a slope → m

x and y are the independent and dependent variables. (They can change). Each x goes with a certain y in an ordered pair: (x,y)

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Using Point-slope

Find the equation of the line with a slope of 8 passing through point (0, 5). Then write it in slope-intercept form.

$y = mx + b$

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

Point-slope: $y - 5 = 8(x - 0)$

$y - 5 = 8x - 0$

$+5 \quad +5$

$y = 8x + 5$

Nov 21-8:31 AM

Steps to write the slope-intercept equation for a line:

$y = mx + b$

**Find the slope (*if necessary*)

**Plug in the slope (m) (*to point-slope form*)

**Plug in one ordered pair (x_1, y_1)

**Solve for y (*leave x and y as variables*)

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Using Point-slope

Find the equation of the line with a slope of $\frac{11}{5}$ *passing through point* (10, -3). *Then write it in slope-intercept form.*

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

$y + (3) = \frac{11}{5}(x - 10)$ → $\frac{11}{5} \cdot \frac{10^2}{1}$

$y + 3 = \frac{11}{5}x - \frac{110}{5}$

$y + 3 = \frac{11}{5}x - 22$

$-3 \quad -3$

$y = \frac{11}{5}x - 25$

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Using Point-slope

Find the equation of the line with a slope of -10 *passing through point* (-1, 12). *Then write it in slope-intercept form.*

$y - 12 = -10(x + (+1))$

$y - 12 = -10x - 10$

$+12 \quad +12$

$y = -10x + 2$

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Using Point-slope

Find the equation of the line passing through points (-3, 8) *and* (16, -11)*. Then write it in slope-intercept form.*

Find slope: $\frac{8-(-11)}{-3-16} = \frac{19}{-19} = -1$

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

$y - 8 = -1x - 3$

$+8 \quad +8$

$y = -1x + 5$

$y + 11 = -1(x-16)$

$y + 11 = -1x + 16$

$-11 \quad -11$

$y = -1x + 5$

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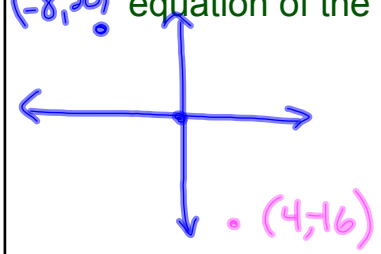
Using Point-slope

A subway express train runs in a straight line under a city's downtown district. The first subway station is located 20 blocks north and 8 blocks west of the center of the city. The second station on the other side of downtown is located 16 blocks south and 4 blocks east of the city's center. Find the equation of the line that maps the subways route.



(-8,20) and (4,-16)

$m = \frac{-16-20}{4-(-8)} = \frac{-36}{12} = -3$

$y + 16 = -3(x-4)$

$y + 16 = -3x + 12$

$-16 \quad -16$

$y = -3x - 4$

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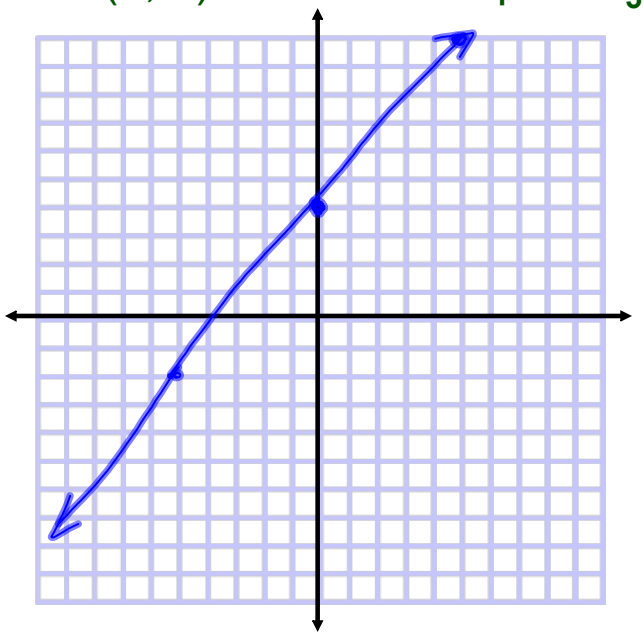
Graph the line that starts at (0, 4) and has a slope of $\frac{6}{5}$.



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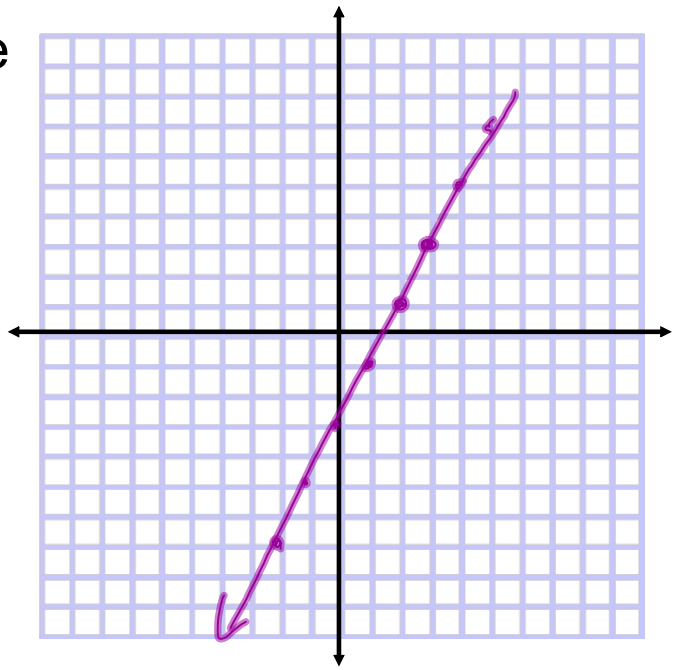
Graphing Point-slope

Graph the line that has the equation:

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

$m = 2$

$(2, 1)$



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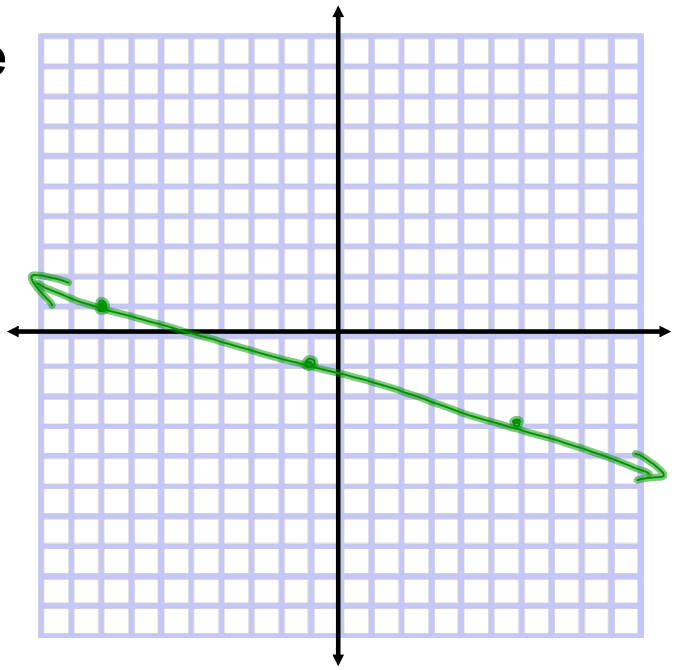
Graphing Point-slope

Graph the line that has the equation:

$y - 1 = -\frac{2}{7}(x + 8)$

$y - 1 = -\frac{2}{7}(x - (-8))$

$m = -\frac{2}{7}$ $(-8, 1)$



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Finding Point-slope from a graph

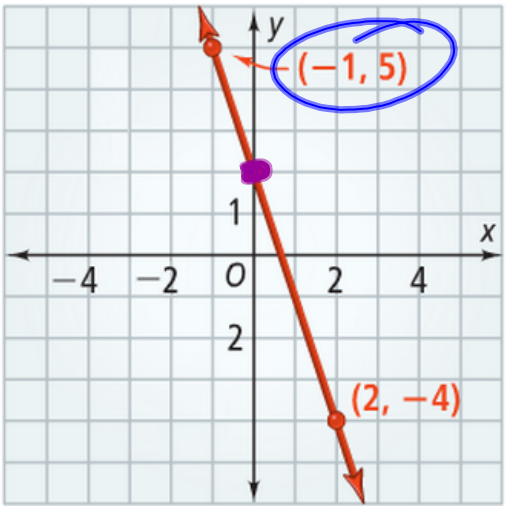
$m = -3$

$(-1, 5)$

$y - 5 = -3(x + 1)$

$y - 5 = -3x - 3$

$y = -3x + 2$



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