

Finding Slope from 2 Points

Slope Formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Ex: Find the slope of the line that passes through the points $(-9, -3)$ and $(7, -7)$

Special Cases:

$\frac{0}{\#} \rightarrow$ slope = 0

$\frac{\#}{0} \rightarrow$ slope is undefined

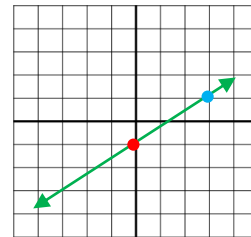
$$m = \frac{-7 - (-3)}{7 - (-9)} = \frac{-4}{16} = \boxed{-\frac{1}{4}}$$

Slope-Intercept Form

$$y = mx + b$$

$m =$ slope & $b =$ y-intercept

Ex: Graph $y = \frac{2}{3}x - 1$



y-intercept is -1
slope = $\frac{2}{3}$, (so from the y-intercept go up 2 & right 3)

Graphing from Slope-Intercept Form:

1. Make a point at the y-intercept.
2. Use the slope ($\frac{\text{rise}}{\text{run}}$) to make more points.
3. Connect the points to form a line.

Standard Form

$$Ax + By = C$$

$A, B,$ & C are integers & A is not negative

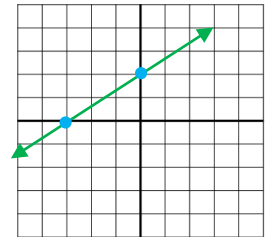
Ex: Graph $2x - 3y = -6$

Graphing Using Intercepts:

1. Find the x-intercept by substituting 0 for y .
2. Find the y-intercept by substituting 0 for x .
3. Make a point at each intercept and then connect the points to form a line.

x-intercept: $2x - 3(0) = -6$
 $2x = -6 \rightarrow x = -3$
 $(-3, 0)$

y-intercept: $2(0) - 3y = -6$
 $-3y = -6 \rightarrow y = 2$
 $(0, 2)$



Point-Slope Form

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

$m =$ slope & (x_1, y_1) is a point on the graph

Ex: Write the equation of the line passing through the points $(-1, 2)$ and $(3, 4)$ in point-slope form. Then convert it to slope-intercept and standard form.

Converting Point-Slope Form to Slope-Intercept Form:

1. Distribute m .
2. Move y_1 to the other side of the equation.

Converting Slope-Intercept Form to Standard Form:

1. Bring the x term to the left.
2. If there are fractions in the equation, multiply everything through by the least common denominator.
3. If A is negative, multiply everything through by -1 .

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

Point-Slope Form: $y - 2 = \frac{1}{2}(x + 1)$

Convert to Slope-Intercept Form:

$$\rightarrow y - 2 = \frac{1}{2}x + \frac{1}{2} \rightarrow y = \frac{1}{2}x + \frac{5}{2}$$

Convert to Standard Form:

$$\rightarrow -2\left(-\frac{1}{2}x + y = \frac{5}{2}\right) \rightarrow x - 2y = -5$$

Find the slope of the line that passes through the pair of points.

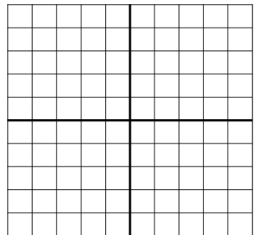
25. $(9, -3)$ and $(9, -8)$

26. $(-8, 5)$ and $(3, -6)$

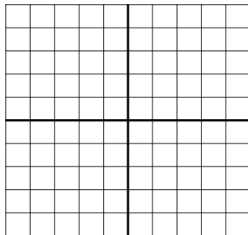
27. $(7, -1)$ and $(15, 9)$

Graph each line.

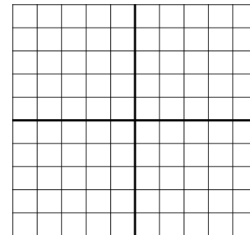
28. $y = -\frac{3}{2}x + 2$



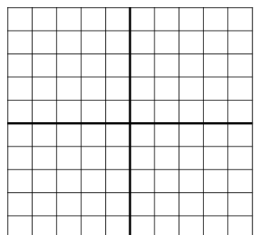
29. $y = x - 3$



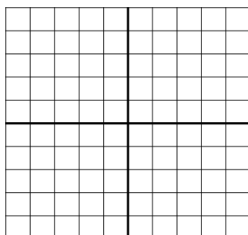
30. $y = \frac{1}{3}x + 5$



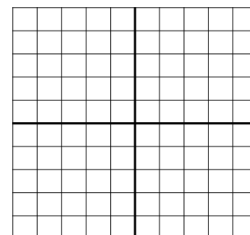
31. $2x - y = -2$



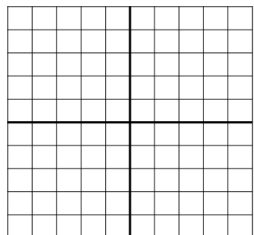
32. $x + y = 4$



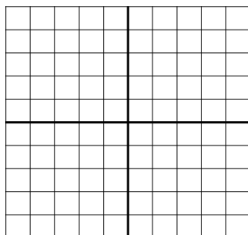
33. $3x + 4y = -12$



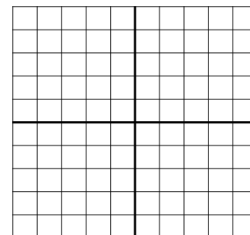
34. $y + 3 = \frac{1}{2}(x + 2)$



35. $y - 1 = \frac{2}{3}(x - 3)$



36. $y - 2 = 0$



Write the equation of the line in point-slope, slope-intercept, and standard form.

37. Line passing through point $(3, 5)$ with a slope of 1

38. Line passing through points $(-4, 2)$ and $(0, 3)$

39. Line passing through points $(1, 3)$ and $(2, 5)$