Lesson 6: Graphing Linear Equations

Friday, August 31, 2018 2:43 AM

Equations of Linear Relations Lesson #6: Graphing Linear Equations

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Graphing Linear Equations Without Technology

Linear equations can be written in different forms:

$Ax + By + C = 0$	→	General form of a linear equation.
$y = mx + b$	→	Slope y-intercept form of a linear equation.
$y - y_1 = m(x - x_1)$	→	Point-slope form of a linear equation.

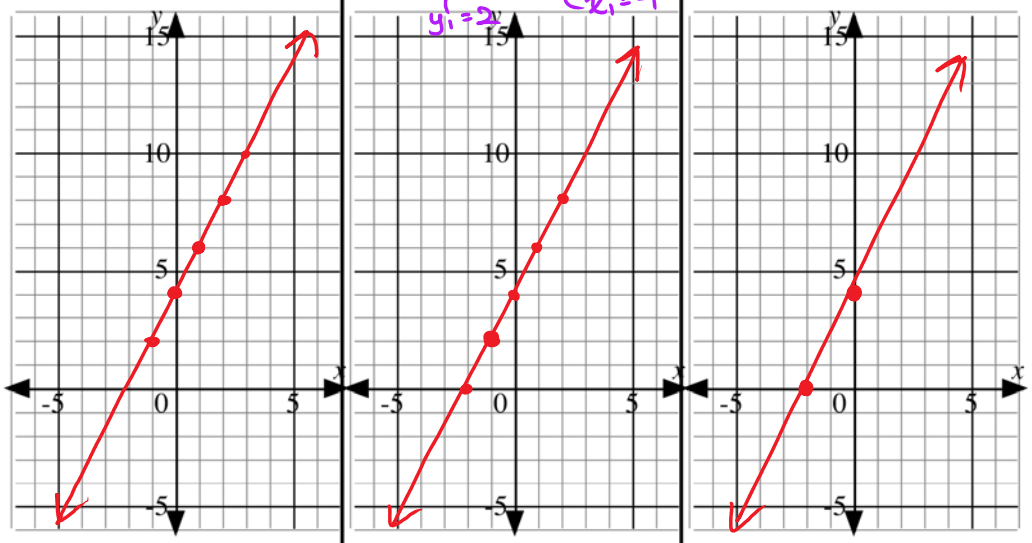
The method used to graph a linear relation without technology depends on the form in which the linear equation is written.

Without altering the form in which the linear equation is written, explain the different strategies used to graph (without technology) each of the following linear relations. Draw the graph of each linear relation on the grid provided.

a) $y = 2x + 4$

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

c) $2x - y + 4 = 0$



Slope = $\frac{2}{1}$

- Start at y-int = 4
- use slope $\left(\frac{\text{rise}}{\text{run}}\right)$ to find more points

$y - y_1 = m(x - x_1)$, $y_1 = 2$, $x_1 = -1$

- Start at point $(-1, 2)$
- use slope to find more points

Slope = $\frac{2}{1}$ ← rise / run

- find x-int: sub in $y = 0$

$2x - 0 + 4 = 0$

$\frac{2x}{2} = \frac{-4}{2}$

$x = -2$

- find y-int: sub in $x = 0$

$2(0) - y + 4 = 0$

$4 = y$

Match each linear relation to its graph.

Equation 1:
$2x - y + 3 = 0$

Equation 2:
$y = -2x + 3$

Equation 3:
$y + 1 = -\frac{1}{2}(x + 4)$

Equation 4:
$2y - x - 6 = 0$

Slopes: pos ↗ neg ↘

Equation 2: slope $\frac{-2}{1}$, y-int = 3

Equation 3: (-4,-1) $\frac{y-(-1)}{x-(-4)}$ $y - y_1 = m(x - x_1)$ $\frac{-1}{2}$

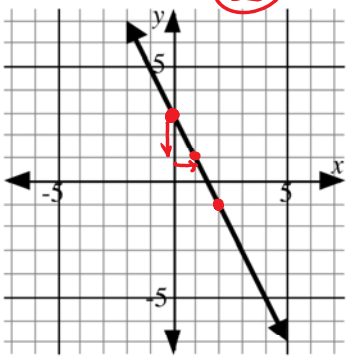
① $2x - y + 3 = 0$ $y = 0$

$2x - 0 + 3 = 0$

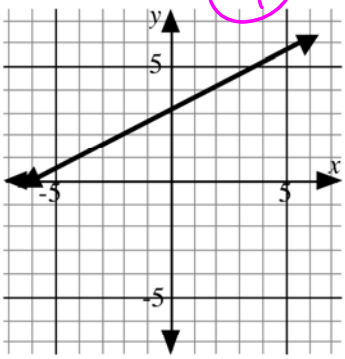
$\frac{2x}{2} = \frac{-3}{2}$

$x = -\frac{3}{2}$ or -1.5

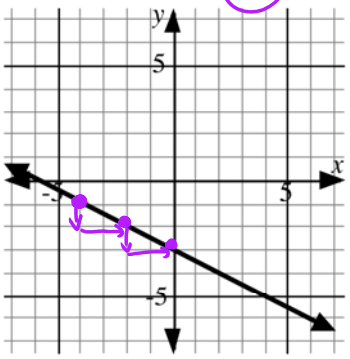
Graph A (2)



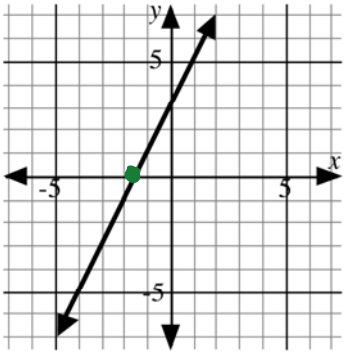
Graph B (4)



Graph C (3)

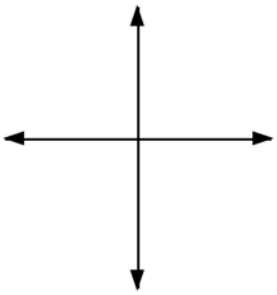


Graph D (1)



Graphing Linear Equations With Technology

- Explain the strategy used to graph (with technology) the linear relations.
  $y + 8 = -5(x - 2)$ and $4x - y + 9 = 0$



- State an appropriate window to show x- and y-intercepts, and draw the graph of both linear relations on the same grid.

- Determine the x and y-intercepts of $4x - y + 9 = 0$.

Complete Assignment Questions #1 - #6

Determining Linear Relationships from Tables of Data

Consider the following data points expressed in a table of values

x	2	4	6	8	10
y	-1	0	1	2	3

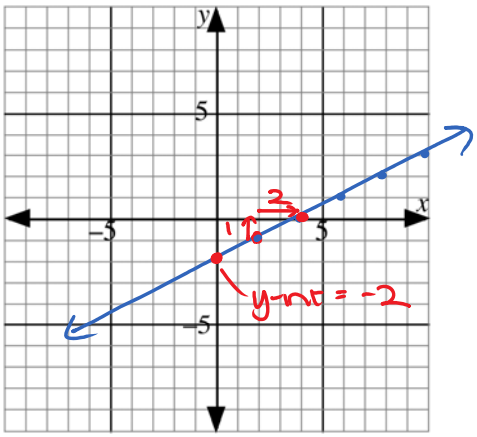
a) Plot the data points on the grid to verify that there is a linear relationship.

b) Join the points together and determine the slope of the line.

$m = \frac{1}{2}$

c) Determine the equation of the linear relationship in the form $y = mx + b$.

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



Complete Assignment Questions #7 - #10

Assignment

1. Without using technology or without altering the form in which the linear equation is written, explain how to graph $y = -3x - 6$ on a grid.
Draw the graph on the grid provided.