

Study Guide

Graphing Linear Equations

You can graph a **linear equation** $Ax + By + C = 0$, where A and B are not both zero, by using the x - and y -intercepts. To find the x -intercept, let $y = 0$. To find the y -intercept, let $x = 0$.

Example 1 Graph $4x + y - 3 = 0$ using the x - and y -intercepts.

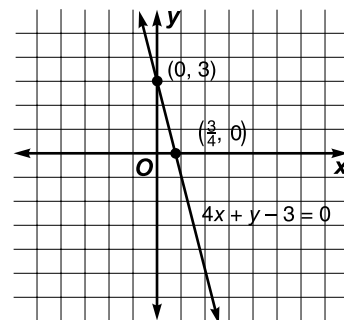
Substitute 0 for y to find the x -intercept. Then substitute 0 for x to find the y -intercept.

x -intercept

$$\begin{aligned} 4x + y - 3 &= 0 \\ 4x + 0 - 3 &= 0 \\ 4x - 3 &= 0 \\ 4x &= 3 \\ x &= \frac{3}{4} \end{aligned}$$

y -intercept

$$\begin{aligned} 4x + y - 3 &= 0 \\ 4(0) + y - 3 &= 0 \\ y - 3 &= 0 \\ y &= 3 \end{aligned}$$



The line crosses the x -axis at $(\frac{3}{4}, 0)$ and the y -axis at $(0, 3)$.

Graph the intercepts and draw the line that passes through them.

The **slope** of a nonvertical line is the ratio of the change in the y -coordinates of two points to the corresponding change in the x -coordinates of the same points. The slope of a line can be interpreted as the ratio of change in the y -coordinates to the change in the x -coordinates.

Slope	The slope m of a line through two points (x_1, y_1) and (x_2, y_2) is given by $m = \frac{y_2 - y_1}{x_2 - x_1}$
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Example 2 Find the slope of the line passing through $A(-3, 5)$ and $B(6, 2)$.

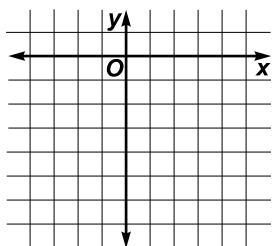
$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{2 - 5}{6 - (-3)} \quad \text{Let } x_1 = -3, y_1 = 5, x_2 = 6, \text{ and } y_2 = 2. \\ &= \frac{-3}{9} \text{ or } -\frac{1}{3} \end{aligned}$$

Practice

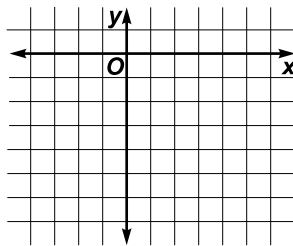
Graphing Linear Equations

Graph each equation using the x - and y -intercepts.

1. $2x - y - 6 = 0$

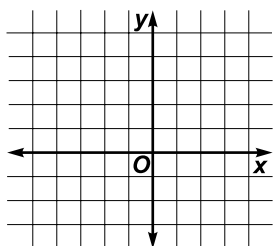


2. $4x + 2y + 8 = 0$

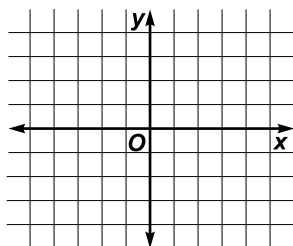


Graph each equation using the y -intercept and the slope.

3. $y = 5x - \frac{1}{2}$

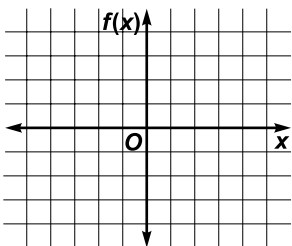


4. $y = \frac{1}{2}x$

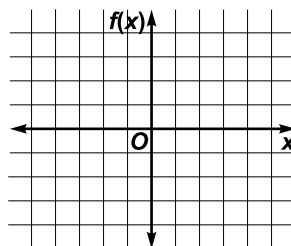


Find the zero of each function. Then graph the function.

5. $f(x) = 4x - 3$



6. $f(x) = 2x + 4$



- 7. Business** In 1990, a two-bedroom apartment at Remington Square Apartments rented for \$575 per month. In 1999, the same two-bedroom apartment rented for \$850 per month. Assuming a constant rate of increase, what will a tenant pay for a two-bedroom apartment at Remington Square in the year 2000?