

## Exercise 37

For the following exercises, given each set of information, find a linear equation satisfying the conditions, if possible.

$x$  intercept at  $(-5, 0)$  and  $y$  intercept at  $(0, 4)$

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### Solution

The general formula for the equation of a line is

$$y = mx + b.$$

The first condition says that when  $x = -5$ ,  $y = 0$ .

$$0 = m(-5) + b$$

The second condition says that when  $x = 0$ ,  $y = 4$ .

$$4 = m(0) + b$$

This is a system of two equations with two unknowns that can be solved.

$$\begin{cases} -5m + b = 0 \\ b = 4 \end{cases}$$

Plug the value for  $b$  into the first equation.

$$-5m + (4) = 0$$

Solve for  $m$ .

$$-5m = -4$$

$$m = \frac{4}{5}$$

Now that  $m$  and  $b$  are solved for, the equation of the line is known.

$$y = \frac{4}{5}x + 4$$