

Exercise 73

For the following exercises, write the equation of the line satisfying the given conditions in slope-intercept form.

$$x\text{-intercept} = 5 \text{ and } y\text{-intercept} = -3$$

Solution

The x -intercept is the point where the line touches the x -axis, and the y -intercept is the point where the line touches the y -axis.

$$(5, 0) \quad \text{and} \quad (0, -3)$$

Start by finding the slope of the line between these points.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-3 - 0}{0 - 5} = \frac{-3}{-5} = \frac{3}{5}$$

The general equation for a line is

$$y = mx + b$$

In this exercise it's

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

Use the fact that the line goes through $(5, 0)$ to find b .

$$0 = \frac{3}{5}(5) + b$$

$$0 = 3 + b$$

$$b = -3$$

Therefore,

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