

## Exercise 51

For the following exercises, which of the tables could represent a linear function? For each that could be linear, find a linear equation that models the data.

$x$	0	2	4	6
$g(x)$	6	-19	-44	-69

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### Solution

This table represents a linear function because as  $x$  increases by 2,  $g(x)$  increases by  $-25$ . Two points on this line are

$$(0, 6) \text{ and } (2, -19).$$

The general equation for a line is

$$y = mx + b.$$

The first point says that when  $x = 0$ ,  $y = 6$ .

$$6 = m(0) + b$$

The second point says that when  $x = 2$ ,  $y = -19$ .

$$-19 = m(2) + b$$

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

$$\begin{cases} b = 6 \\ 2m + b = -19 \end{cases}$$

Substitute the value of  $b$  into the second equation.

$$2m + (6) = -19$$

Solve for  $m$ .

$$2m = -25$$

$$m = -\frac{25}{2}$$

Now that  $m$  and  $b$  have been solved for, the line is known.

$$y = -\frac{25}{2}x + 6$$