

Linear functions look like

$$f(x) = mx + b$$

m is the slope

b is the y -intercept [which means it is $f(0)$]

The steps to create a linear function are

1. Find m
2. Find b
3. Write the function

Example 1 – Write a linear function where $m = -2$ and $f(3) = -7$

Step 1 – Find m

We were told what m is $\rightarrow m = -2!$

Let's plug it into the form for a linear function

$$f(x) = -2x + b$$

Step 2 – Find b

We will use the fact that $f(3) = -7$ to help us find b . We will plug it into what we've made so far.

$$\begin{aligned}f(x) &= -2x + b \\-7 &= -2(3) + b \\-7 &= -6 + b \\-1 &= b\end{aligned}$$

Step 3 – Write the function

Plug in the information for m and b .

$$f(x) = -2x - 1$$

Example 2 – Write a linear function where $f(3) = -3$ and $f(6) = -4$

Step 1 – Find m

We will need to calculate the slope m . Remember that $f(x) =$ is a fancy way to say $y =$.

$$m = \frac{-3 - (-4)}{3 - 6} = \frac{-3 + 4}{-3} = \frac{1}{-3}$$

Now we know $m \rightarrow m = -\frac{1}{3}$

Let's plug it into the form for a linear function

$$f(x) = -\frac{1}{3}x + b$$

Step 2 – Find b

We can use either $f(3) = -3$ or $f(6) = -4$ to help us find b – we'll get the same answer! Let's use $f(6) = -4$ and plug it into what we've made so far.

$$\begin{aligned} f(x) &= -\frac{1}{3}x + b \\ -4 &= -\frac{1}{3}(6) + b \\ -4 &= -2 + b \\ -2 &= b \end{aligned}$$

Step 3 – Write the function

Plug in the information for m and b .

$$f(x) = -\frac{1}{3}x - 2$$