

Determining Exponential Functions when given starting value and one data point.

Example 1

Given: $(0, 5)$ and $(7, 48)$ find the exponential function to fit the data.

$$a = 5$$

$$f(x) = 48$$

$$x = 7$$

$$f(x) = ab^x$$

We are missing b :
 $b = (1+r)$

$$1) f(x) = ab^x$$
$$48 = 5b^7$$

$$2) \frac{48}{5} = \frac{5b^7}{5}$$

$$9.6 = b^7$$

$$3) (9.6)^{(1/7)} = (b^7)^{(1/7)}$$

$$(9.6)^{1/7} = b$$

$$1.381 = b$$

$$4) f(x) = 5(1.381)^x$$

← final answer

* The output (y-value) of the ordered pair with input 0 (x-value) becomes your a

* The output of 2nd ordered pair becomes your $f(x)$

* The input of your 2nd ordered pair is your x-value! (time)
your exponent.

1) Plug in values you've determined from ordered pairs

2) Divide both sides by "a" isolate variable.

3) Take the n^{th} (x) root of each side, you can easily do this by raising both sides to $(1/n)$ where n is your exponent.

4) write your equation

* make sure to include at least 3 significant digits when solving for b