Sketch the graph of each function.

1) $y = 4 \cdot 2^x$

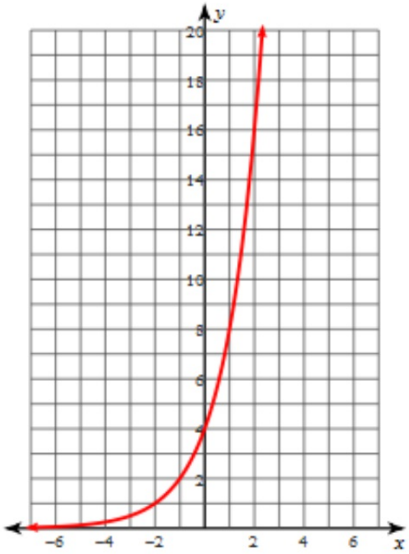
x	y
-1	2
0	4
1	8
2	16
3	32

2) $y = 2 \cdot \left(\frac{1}{3}\right)^x$

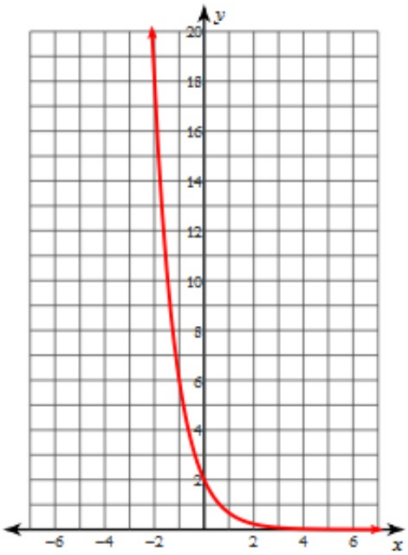
x	y
-1	6
0	2
1	2/3
2	2/9

Sketch the graph of each function.

1) $y = 4 \cdot 2^x$



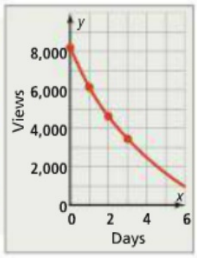
2) $y = 2 \cdot \left(\frac{1}{3}\right)^x$



EXAMPLE 3 Exponential Decay

A video is labeled a fan favorite if it receives at least 1,000 views per day. Amelia posts a video that gets 8,192 views on the first day. The number of views decreases by 25% each day after that. In how many days total will the video stop being a fan favorite?

Number of Days	Views
0	8,192
1	6,144
2	4,608
3	3,456



Decay Rate

0.25

1 − 0.25

0.75

Decay factor

You can model **exponential decay** with a function of the form $f(x) = a \cdot b^x$, where $a > 0$ and $0 < b < 1$.

The **decay factor** is 1 minus the decay rate.

$$f(x) = a \cdot b^x$$

$$f(x) = a(1 - r)^x$$

r is the decay rate.

Step 1 Model the situation.

Let x = time in years, a = initial amount, and r = decay rate.

$$f(x) = a(1 - r)^x$$

$$= 8{,}192(1 - 0.25)^x$$

$$= 8{,}192(0.75)^x$$

The decay factor is written as a decimal less than 1.

Step 2 Write an equation to find x if $f(x) = 1{,}000$.

$$1{,}000 = 8{,}192(0.75)^x$$

Try It! **3.** Suppose the number of views decreases by 20% per day. In how many days will the number of views per day be less than 1,000?

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