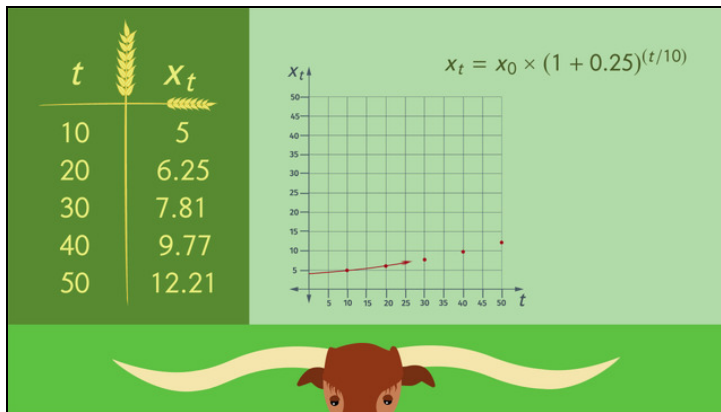




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Exponential Growth and Decay



- 1 Establish the formula for Bevo's shrinking horns.
- 2 Define exponential growth and decay.
- 3 Determine the growth of Bevo's horns.
- 4 Calculate the size of Bevo's horns.
- 5 Decide if either exponential growth or decay is given.
- 6 Decide the corresponding exponential function.
- + with lots of tips, answer keys, and detailed answer explanations for all of the problems.



The complete package, including all problems, hints, answers, and detailed answer explanations is available for all [sofatutor.com](https://www.sofatutor.com) subscribers.



Establish the formula for Bevo's shrinking horns.

Choose the correct formula.



Oh no, Bevo's horns are so tiny!

Bevo's horns were originally 49 feet tall, and their decay rate is 37%.

The equation for exponential decay is given by $x_t = x_0 \times (1 - r)^{\left(\frac{t}{10}\right)}$

- $x_t = 49 \times (1 + 0.37)^{\left(\frac{t}{10}\right)}$ **A**
- $49 = x_0 \times (1 - 0.37)^{\left(\frac{t}{10}\right)}$ **B**
- $x_t = 49 \times (1 - 0.37)^{\left(\frac{t}{10}\right)}$ **C**
- $x_t = 37 \times (1 - 0.49)^{\left(\frac{t}{10}\right)}$ **D**
- $x_t = 49 \times 0.63^{\left(\frac{t}{10}\right)}$ **E**
- $x_t = 37 \times 0.51^{\left(\frac{t}{10}\right)}$ **F**



Hints for solving these problems

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of 6

Establish the formula for Bevo's shrinking horns.

Hint #1

What's the meaning of the terms in the formula?

- $\frac{t}{n}$ is the decaying time by one decay factor in days.
 - x_t is the size after t days.
 - x_0 is the original size, the starting size.
-

Hint #2

Keep in mind that you have to subtract the decay rate from 1.

Hint #3

Distinguish between the original size, that's the size at the beginning, and the size at t , which must be smaller than the original size.



Answers and detailed answer explanations for these problems

1
of 6

Establish the formula for Bevo's shrinking horns.

Answer key: C, E

$$x_t = x_0 \times (1 - r)^{\left(\frac{t}{10}\right)}$$

We already know the formula for exponential decay,

$x_t = x_0 \times (1 - r)^{\left(\frac{t}{10}\right)}$, so all we need to do is put in our known values.

The original size of the horns is 49 feet, so $x_0 = 49$.

The size at t is unknown.

To get the decay factor we have to subtract the rate $r = 0.37$ from 1 to get $1 - 0.37 = 0.63$.

Putting all these values into the exponential decay equation, we get:

$$x_t = 49 \times (1 - 0.37)^{\left(\frac{t}{10}\right)} = 49 \times 0.63^{\left(\frac{t}{10}\right)}.$$