EOC Warm-up!

What is the slope of the line that passes through the points (5, 0) and (10, 0)?

A 0
B 1
C 5
D Undefined

Nov 5-9:59 AM

Exponential Functions

Day 1 Day 1

(Growth or Decay)

Nov 3-3:12 PM

Review:

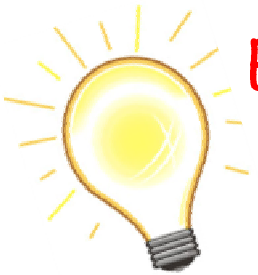
From previous lessons, name 2 characteristics of an exponential function?

1. _____

2. _____

Possible answers

Nov 3-3:21 PM



Exponential Functions Day 1

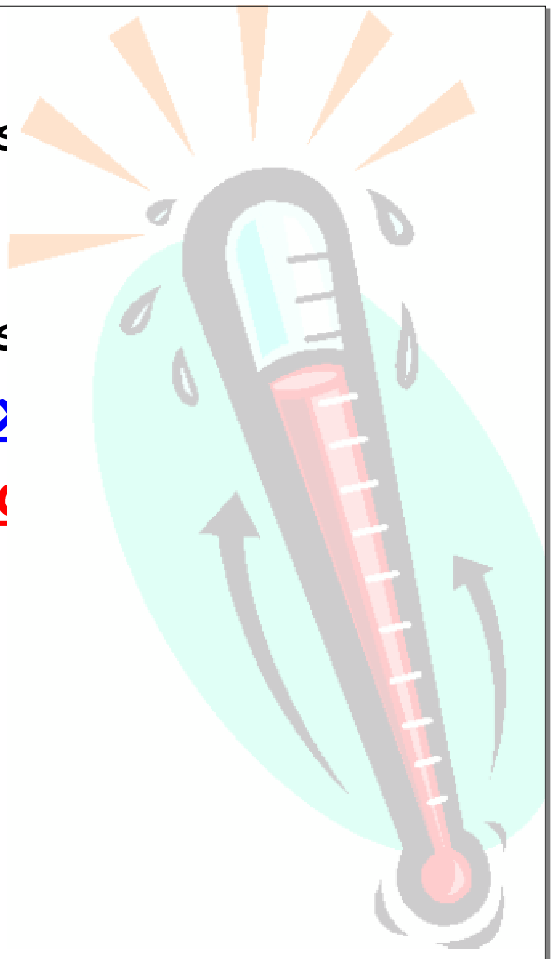
In this lesson, you will be able to:

- Identify exponential growth and decay functions
- Identify the growth/decay factor, rate, and initial value from an equation

Nov 3-3:33 PM

Many real world phenomena can be
functions that describe how things
passes.

Any quantity that grows or decays
regular intervals is said to have ex
or **exponential**



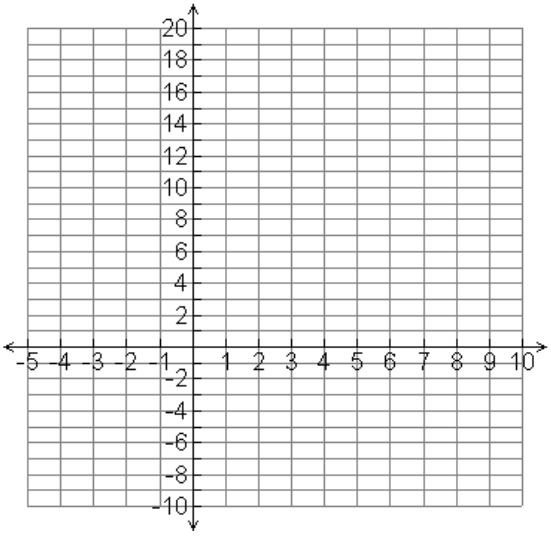
Feb 10-12:56 PM

Let's explore Exponential Growth and Decay Functions!

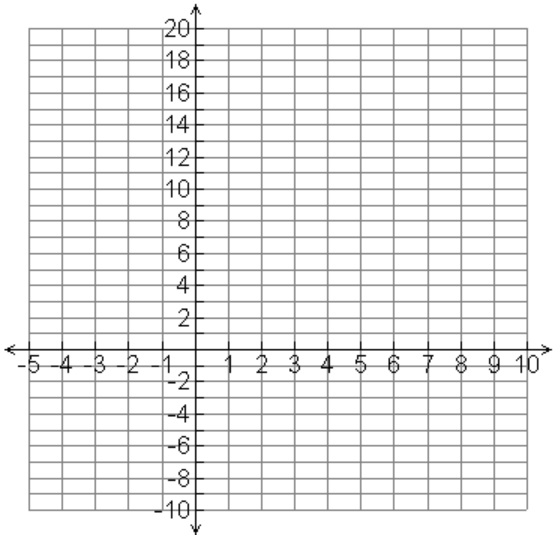
Nov 3-4:15 PM

Graph the following:

1. $y = 1(2)^x$



2. $y = 2(3)^x$

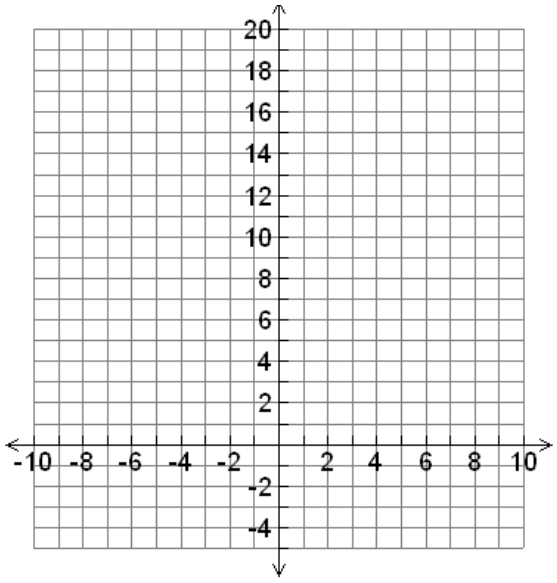


What do you notice about both graphs?

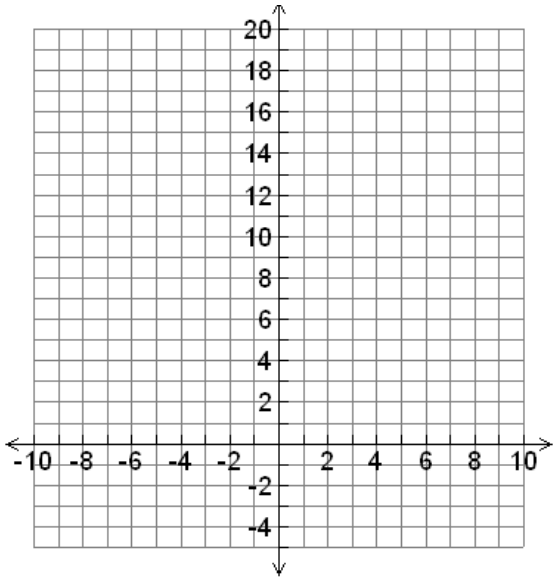
Nov 3-4:20 PM

Graph the following:

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



4. $y = 2(.4)^x$



What do you notice about both graphs?

Nov 3-4:36 PM

Compare equations 1 & 2 with equations 3&4 What did you discover????

Let's talk about it!

1. $y = 1(2)^x$

2. $y = 2(3)^x$

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

4. $y = 2(.4)^x$

Nov 3-4:44 PM

Exponential Growth

$$y = a(b)^x$$

When **a > 0** and ***b* is greater than 1**, the graph will be increasing (growing).

$$y = 1(2)^x$$

So for this example, each time x is increased by 1, y increases by a factor of 2.

Feb 10-12:34 PM

Exponential Decay

$$y = a(b)^x$$

When **a > 0** and ***b* is between 0 and 1**, the graph will be decreasing (decaying).

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

So for this example, each time x is increased by 1, y decreases to half of its previous value.

Nov 3-5:19 PM

Exponential Growth or Decay?

Exponential Growth or Decay?

Feb 10-8:26 AM

Feb 10-12:47 PM

Give two examples of each:

Exponential Growth

Exponential Decay

Feb 10-1:42 PM

Now that we can identify:

Exponential

Growth and Decay

Functions

Let's identify each part of the exponential function!

Nov 3-5:48 PM

The general equation for an exponential growth function is:

$y = a(b)^x$ where,

a : Initial value

If b > 1: Exponential Growth

then b: Growth factor

and r: Growth rate $b = 1 + r$

Nov 3-4:56 PM

The general equation for an exponential decay function is:

$y = a(b)^x$ where,

a : Initial value

If 0 < b < 1 : Exponential Decay

then b: Decay factor

and r: Decay rate $b = 1 - r$

Nov 3-6:18 PM

Identify the initial value, the growth or decay factor, and the growth or decay rate of the exponential function.

Example 1 $y = 3(1.8)^x$

Growth or decay _____
Initial value _____
Growth or decay factor _____
Growth or decay rate _____

Nov 3-4:10 PM

Identify the initial value, the growth or decay factor, and the growth or decay rate of the exponential function.

Example 2 $y = 2.1(1.04)^x$

Growth or decay _____
Initial value _____
Growth or decay factor _____
Growth or decay rate _____

Nov 3-6:32 PM

Identify the initial value, the growth or decay factor, and the growth or decay rate of the exponential function.

Example 3 $y = 9(.8)^x$

Growth or decay _____
Initial value _____
Growth or decay factor _____
Growth or decay rate _____

Nov 3-6:35 PM

Identify the initial value, the growth or decay factor, and the growth or decay rate of the exponential function.

Example 4 $y = 2(.94)^x$

Growth or decay _____
Initial value _____
Growth or decay factor _____
Growth or decay rate _____

Nov 3-6:35 PM

Identify the initial value, the growth or decay factor, and the growth or decay rate of the exponential function.

Example 5 $y = 0.3^x$

Growth or decay _____
Initial value _____
Growth or decay factor _____
Growth or decay rate _____

Nov 3-6:36 PM

Identify the initial value, the growth or decay factor, and the growth or decay rate of the exponential function.

Example 6 $y = 3(2)^x$

Growth or decay _____
Initial value _____
Growth or decay factor _____
Growth or decay rate _____

Nov 3-8:10 PM

Ex: 7 The Johnson Company calculates the value of its stock each year by using the function $y = 120\ (.98)^x$.

Identify the initial value, the growth or decay factor, and the growth or decay rate of the exponential function.

Growth or decay _____

Initial value _____

Growth or decay factor _____

Growth or decay rate _____

Nov 3-6:37 PM

Ex: 8

Selena's starting salary for her new marketing management job is $32,000. She calculates her projected salary for the next 5 years by using the function $y = 32{,}000(1.12)^x$.

Identify the initial value, the growth or decay factor, and the growth or decay rate of the exponential function.

Growth or decay _____

Initial value _____

Growth or decay factor _____

Growth or decay rate _____

Nov 3-6:57 PM

Nov 3-7:14 PM