

Introduction to exponential growth and decay 4.6.17

HAND BACK TEST.

Warm up.

We have worked with the graphs when x is squared why don't we try when x is the exponent.

Graph the following equations

$$y = 1(2)^x \quad y = 2(3)^x \quad y = 1\left(\frac{1}{2}\right)^x \quad y = 2(.4)^x$$

What do you notice about the difference in the graphs.

Exponential growth: $y = a(b)^x$ a is greater than 0 and b is greater than 1 the graph will always be increasing.

For example $y = 1(2)^2$ each time x is increased by 1 y is increased by a factor of 2.

Exponential Decay: $y = a(b)^x$ When a is greater than 0 and b is between 0 and 1, the graph will decreasing (decaying).

For Example: $y = a\left(\frac{1}{2}\right)^x$ For each increase of one in the x , y decreases to half of its previous value.

For each of the general equations exponential growth or decay:

A: Initial value

If $b > 1$ Exponential growth means b is the growth factor

And $r =$ growth rate $b = 1 + r$

If $0 < b < 1$ Exponential Decay the b means decay factor

And $r =$ Decay factor $b = 1 - r$

Given $y = 3(1.8)^x$

Is it growth or decay? What is the initial value? Growth or decay factor? Growth or decay rate?

Given: $y = 9(0.8)^x$

Is it growth or decay? What is the initial value? Growth or decay factor? Growth or decay rate?

HW: Fill out a table with the x -values of -3,-2,-1,0,1, 2, 3 Find the y -values and plot what you can for the problems PG558 #13 and 16