

EXponential FUNCTIONS

**Dancing Building
(Prague, Czech Republic)**



State Standards:

You will learn how to graph an exponential function.

You will determine if a function has exponential growth or decay by looking at the formula.

In the real world??

- *change in population (increase or decrease)
- *change in value (appreciates-gains value; depreciates-loses value)
- *anything that grows or decreases quickly

What is an exponential function?

*a function that grows or decays quickly

$y = ab^x$ when $b > 0$ and $b \neq 1$

$$y = 3(.75)^x$$

$$y = 2(1.40)^x$$

Why can't b equal 1??? 1^x is always 1

Exponential Behavior?

x	0	1	2	3
y	1	6	36	216

x	4	6	8	10
y	5	9	13	17

linear

Growth or Decay Factor:

*if $b > 1$, then there is a growth.

*if $b < 1$, then there is a decay.

Growth or decay? Factor?

$$y = 4(1.6)^t$$

growth (1.6)

$$y = 3(1.5)^t$$

growth (1.5)

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

decay (.4)

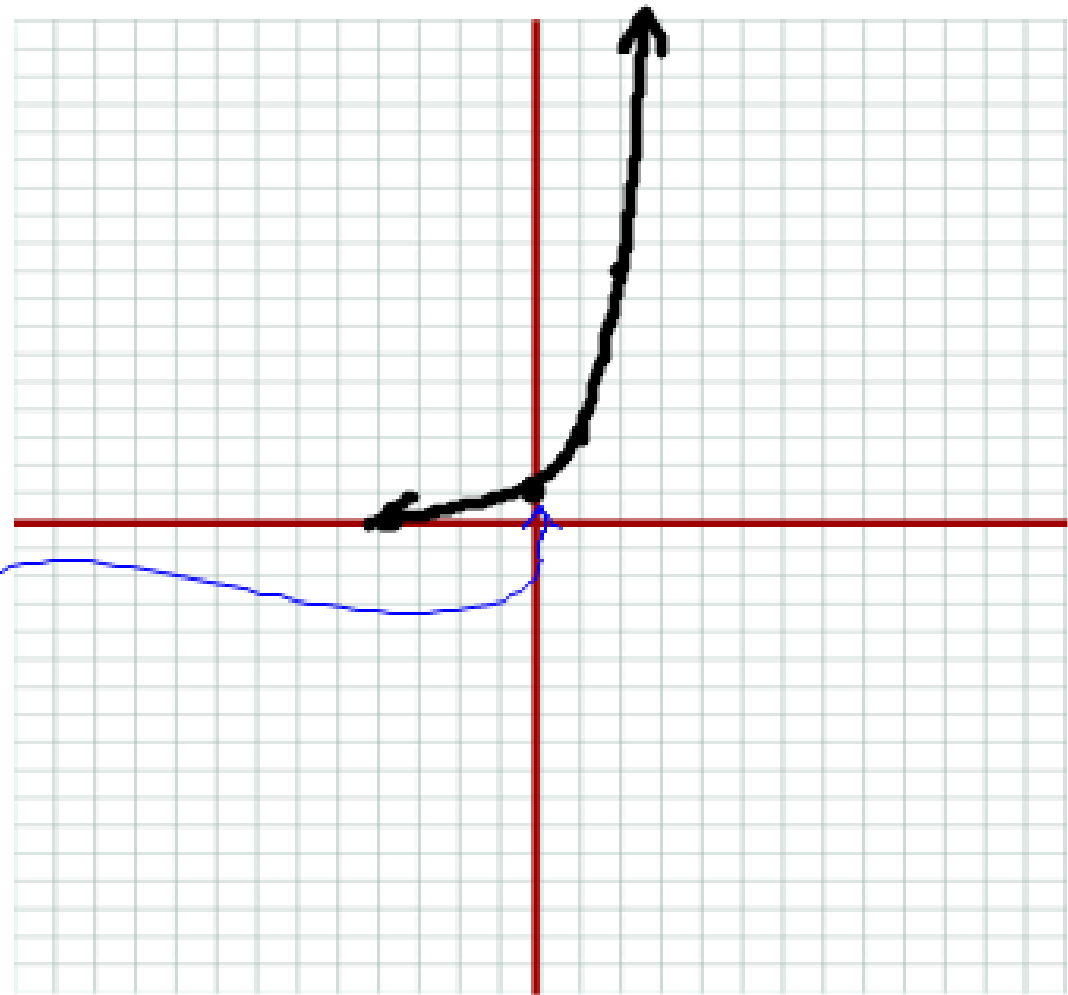
$$y = 2(.1)^t$$

decay (.1)

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

x	y
0	1
1	3
2	9
3	27
4	81

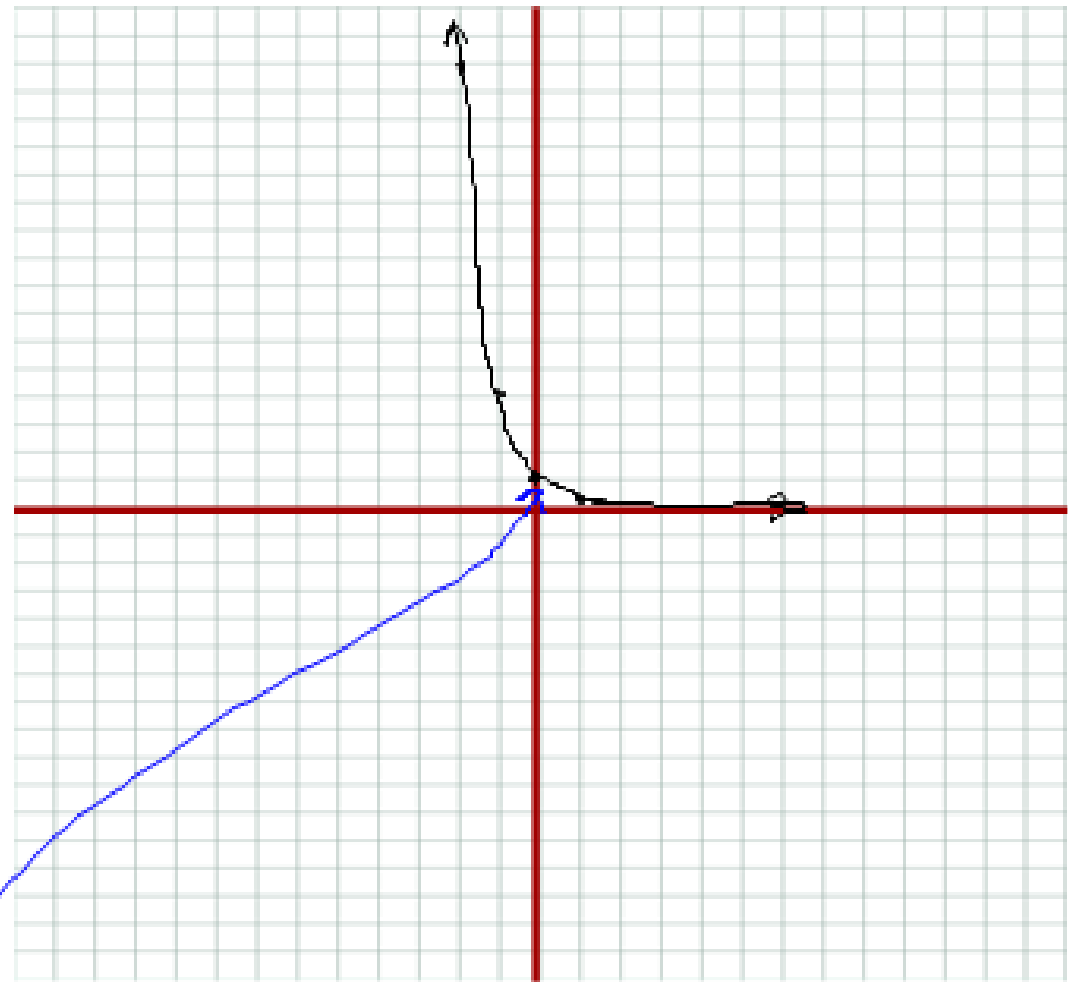
y-intercept: $(0, 1)$



When $b > 1$ then there is GROWTH

$$y = \left(\frac{1}{4}\right)^x$$

x	y
0	1
1	$\frac{1}{4}$
2	$\frac{1}{16}$
3	$\frac{1}{64}$
4	$\frac{1}{256}$



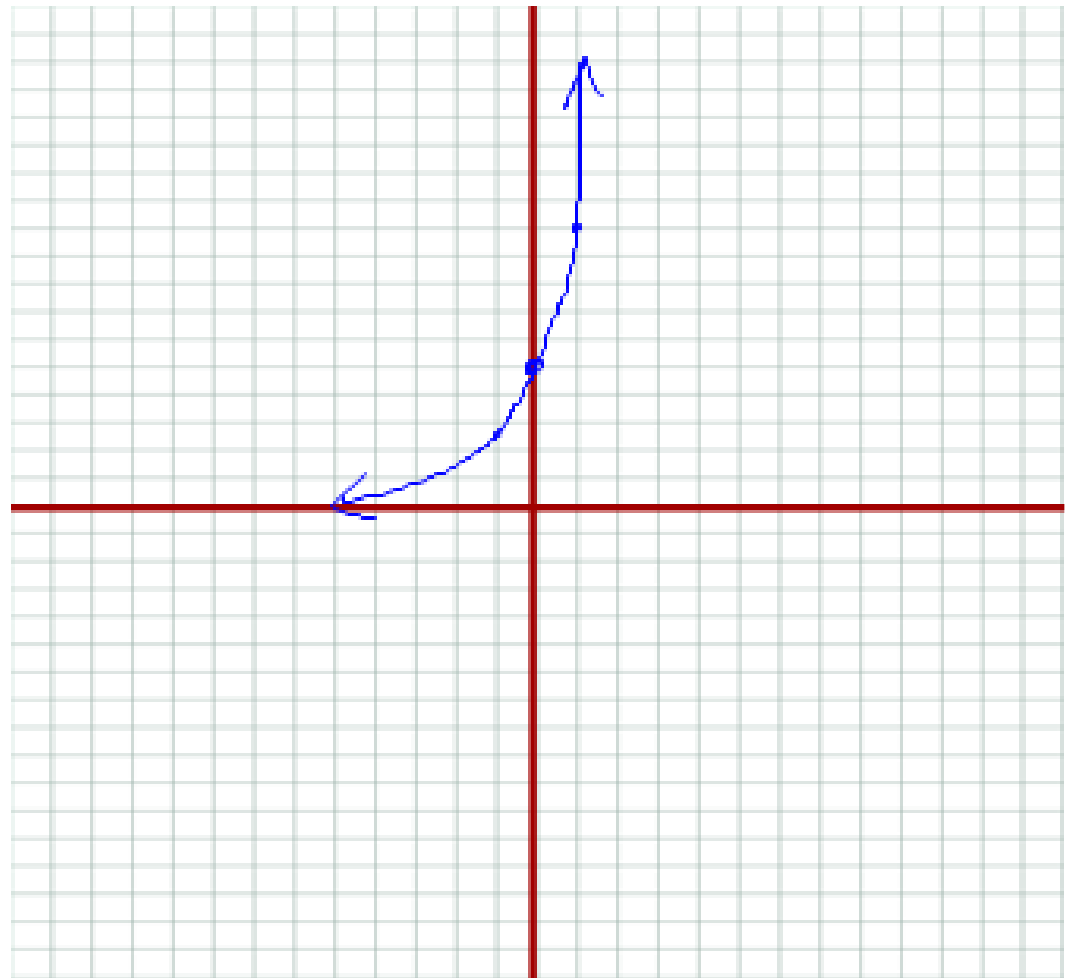
y-intercept: $(0, 1)$

When $0 < b < 1$ then there is **DECAY**

$$y = 5(2^x)$$

x	y
0	5
1	10
2	20
3	40
4	80

y-intercept: $(0, 5)$



Homework!!

Practice worksheet

Calakmul building a.k.a La Lavadora a.k.a The Washing Mashine (Mexico, Mexico)

