

Writing Exponential Functions

Day 2 HW

Name key

Date _____ Block _____

EX:

x	y
0	6.32
1	31.6
2	158
3	790
4	3950

$3950 \div 790 = \underline{5}$, $790 \div 158 = \underline{5}$ so $b = \underline{5}$

Based on the value above, this function is an Exponential Growth or Exponential Decay?
It is an Exponential Growth since $b > 1$

To find the initial value, a , work backwards in the table until you find the value of y when $x = 0$.

$158 \div 5 = 31.6$, $31.6 \div 5 = 6.32$ Fill in the table.

This means the initial value $a = \underline{6.32}$

Write the Exponential equation in the form $y = a \cdot b^x$

$y = 6.32 \cdot (5)^x$

Write an exponential function for each table below using the steps above in Example 1.

1. $y = 12(2.9)^x$

x	y
0	12
1	34.8
2	100.92
3	292.668
4	848.7372

2.9
2.9
2.9
2.9

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

x	y
1	2
2	1
3	.5
4	.25
5	.125

$\frac{1}{2}$
 $\frac{1}{2}$
 $\frac{1}{2}$
 $\frac{1}{2}$

3. $y = 9.4(0.3)^x$

x	y
2	.846
3	.2538
4	.07614
5	.022842
6	.0068526

.3
.3
.3
.3

4.

Years since 2000	4	8	12	16
Population	336	5376	86016	1376256

$336 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 5376$...

$\frac{5376}{336} = 16$
every 4 years

Write an exponential function to represent population growth since the year 2000.

$y = 21(2)^x$

$b = \sqrt[4]{16} = 2$

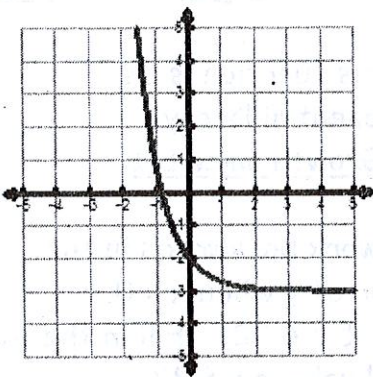
Initial value at $x = 0$, $\frac{336}{16} = 21$

or: $336 \div 2 \div 2 \div 2 \div 2 = 21$

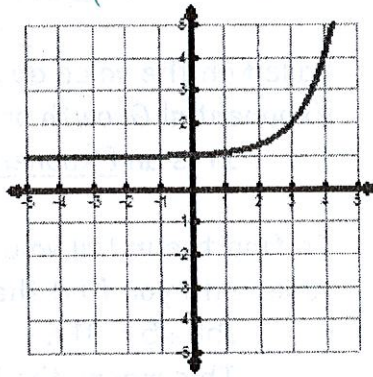
Practice- Practice- Practice- Practice- Practice- Practice- Practice- Practice- Practice- Practice! ☺

Determine whether each function below represents an Exponential Growth or Decay.

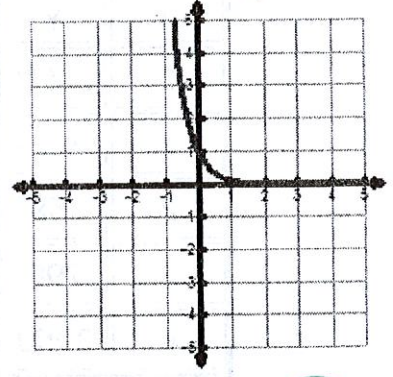
5. Growth or Decay?



6. Growth or Decay?



7. Growth or Decay?



8. Exponential Growth or Decay?

$$y = .1(7)^x$$

9. Exponential Growth or Decay?

$$y = 3(.25)^x$$

10. Exponential Growth or Decay?

$$y = \left(\frac{3}{4}\right)^x$$

11. Exponential Growth or Decay?

$$y = \frac{1}{2}\left(\frac{5}{3}\right)^x$$

12. Given $f(x) = 4(5.6)^x$, identify the growth/decay factor, growth/decay rate, and the initial value.

Growth/Decay Factor 5.6

Growth/Decay Rate 4.6 → 460% (initial)

Initial Value 4

13. Given $f(x) = 11(.40)^x$, identify the growth/decay factor, growth/decay rate, and the initial value.

Growth/Decay Factor 0.4

Growth/Decay Rate -0.6 = 60%

Initial Value 11

13. Given $f(x) = \left(\frac{1}{4}\right)^x$, identify the growth/decay factor, growth/decay rate, and the initial value.

Growth/Decay Factor 0.25 or $\frac{1}{4}$

Growth/Decay Rate -0.75 = 75%

Initial Value 1