

1.) Classify the function as exponential growth or exponential decay.

a)  $y = 4\left(\frac{7}{6}\right)^x$   
growth

b)  $y = 9\left(\frac{6}{7}\right)^x$   
decay

c)  $y = \frac{3}{4}\left(\frac{2}{5}\right)^x$   
decay

d)  $y = \frac{1}{3} \cdot 5^x$   
growth

2.) Evaluate the following expressions for  $x = -3$  and  $x = 2$ .

a)  $f(x) = \left(\frac{1}{6}\right)^x$   
 $f(-3) = \left(\frac{1}{6}\right)^{-3} = 216$   
 $f(2) = \left(\frac{1}{6}\right)^2 = \frac{1}{36}$

b)  $f(x) = 3^x$   
 $f(-3) = 3^{-3} = \frac{1}{27}$   
 $f(2) = 3^2 = 9$

3.) Graph the following functions and identify the indicated characteristics.

a.)  $y = (3)^{x-2} + 4$

$y = 3^x$

x	y
-1	1/3
0	1
1	3

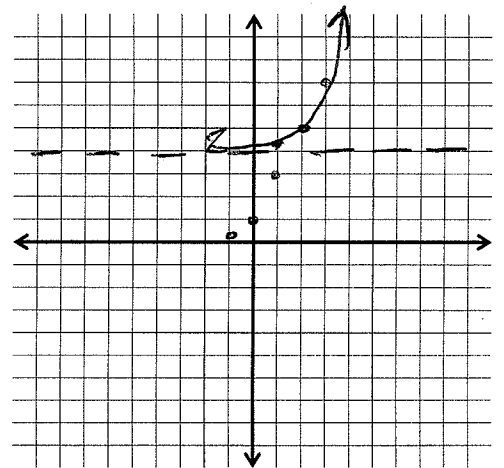
Growth or Decay?

Describe the shift: right 2, up 4

Asymptote:  $y = 4$

Domain:  $(-\infty, \infty)$  Range:  $(4, \infty)$

y-intercept:  $(0, 4.11)$



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

x	y
-1	2
0	1
1	1/2

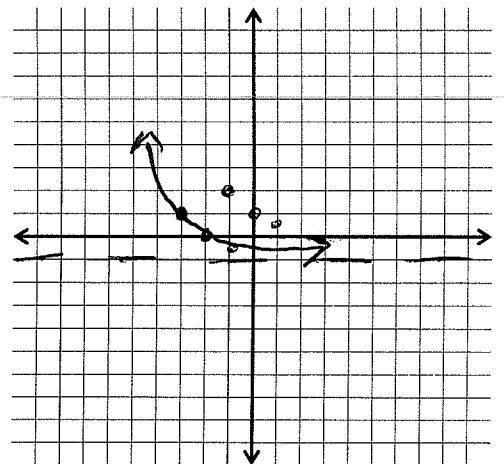
Growth or Decay?

Describe the shift: left 2, down 1

Asymptote:  $y = -1$

Domain:  $(-\infty, \infty)$  Range:  $(-1, \infty)$

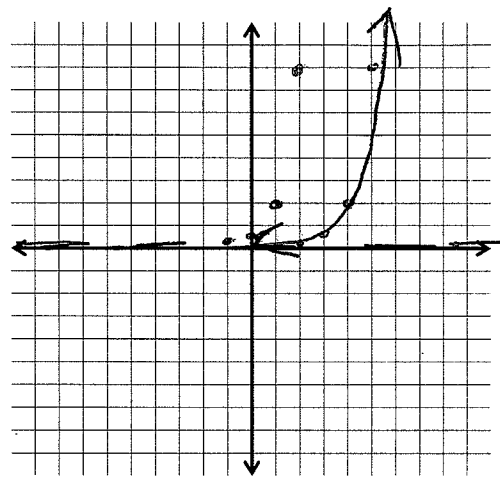
y-intercept:  $(0, -3/4)$



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

c.)  $y = \frac{1}{2}(4)^{x-3}$

x	y	Growth or Decay?
-1	1/8	Describe the shift: <u>right 3</u> Asymptote: <u>y=0</u> Domain: <u><math>(-\infty, \infty)</math></u> Range: <u><math>(0, \infty)</math></u> y-intercept: <u><math>(0, .0078)</math></u>
0	1/2	
1	2	
2	8	



4.) You buy a new stereo system for \$640. The value of the stereo system decreases by 7% each year.

1. Write an exponential model for the situation.

$$y = 640(1 - .07)^t \quad \text{or} \quad y = 640(.93)^t$$

2. What is the value of the stereo 10 years after you bought it?

$$y = 640(1 - .07)^{10}$$

$$= \boxed{\$309.75}$$

5.) You deposit \$3,000 in an account that pays 1.25% annual interest. Find the balance after 5 years if the interest is compounded quarterly.

$$A = 3000 \left( 1 + \frac{.0125}{4} \right)^{4 \cdot 5}$$

$$= \boxed{\$3,193.17}$$