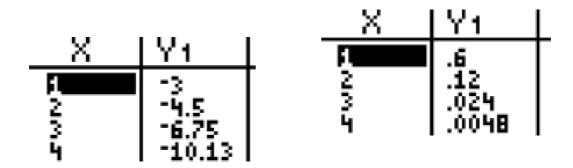
Warm Up

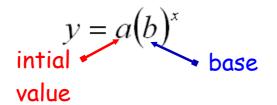
Determine the common ratio for each of the following:



Determine an equation that would define each of the above sets of data:

(Hint: Look around your TI-83 for some help!!)

Transformations of the Exponential Function



check with...



Properties:

If b > 1, then the graph will be GROWTH

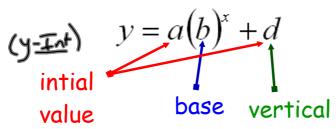
If 0 < b < 1, then the graph will be **DECAY**

y - intercept: happens when x = 0, so... | y-int = a

$$y$$
-int = a

Transformations of the Exponential Function

check with...



TI 44 Plus Sive Edition

To the Control of the Cont

Properties:

translation

If b > 1, then the graph will be GROWTH

If 0 < b < 1, then the graph will be DECAY

y - intercept: happens when x = 0, so...

y-int = a + d

Horizontal Asymptote - a horizontal line that a graph approaches but never intersects.

Equation of Horizontal Asymptote will be...

y = d

Domain - describes all possible *x*-values Range - describes all possible *y*-values

Thus, for exponential functions... Domain: $\{x \in R\}$

Range: $\{y > d\}$

Horizontal Asymptote

Exercise: Complete the following table...

Equation	Growth/Decay	y-intercept	Eq'n for Horizontal Asymptote
$y = 3(5)^x - 4$	C	-1	7=-4
$y = 4\left(\frac{2}{5}\right)^x + 1$	17	5	y=1
$y = 2^x - 2$	Cı	- 7	オニーチ
$y = \frac{3}{4} \left(\frac{1}{2}\right)^x$	0	314	y=0
$y = 5(3)^x$	C	5	ソ=0



- p. 129 #9 12
- p. 140 #43 (without technology) #44 #46

Solutions

- p. 129 9. b. This graph has a horizontal asymptote at y = 0.
 - c. The y intercept is at (0,2).
 - e. The graph is a decay curve, since 0 < b < 1.

10.

Question	Function	y-intercept	Growth or decay	Reason
а	y = 4(3.2)×	(0,4)	growth	b = 3.2 > 1
þ	y = 2.1(0.8) ^X	(0, 2.1)	decay	b = 0.8 < 1
С	y = 0.3(1.1) [×]	(0,0.3)	growth	b = 1.1 > 1
d	y = 0.7(0.85)×	(0,0.7)	decay	b = 0.85 < 1

- 11. All three functions have a = 1, since they all cross the y axis at y = 1. The function f has a b that is greater than 0 but less than 1, since it is a decay curve. The functions g and h both have a b that is greater than 1, since they are both growth curves. The b in the equation for g will be greater than the b in the equation for h, since the curve for the function g rises at a faster rate than the curve for the function h.
- 12. a. f has a = 1, g has a = 2 and h has a = 3. We can see this by looking at the y intercepts of each of the graphs. For all three graphs, the ratio of successive y terms is 1.5, so the b for all three is equal to 1.5 b. The equations would be $f(x) = 1.5^{\times}$, $g(x) = 2(1.5)^{\times}$ and $h(x) = 3(1.5)^{\times}$.
- p. 140 #43. b) T

Equation	Eq'n for Horizontal	
	Asymptote	
$y=2^x$	Y = 0	
$y=2^x-1$	Y = -1	
$y = 2^x + 3$	Y=3	

#44. a) ii b) iv c) v d) vi e) i f) iii

#46.

Equation	Growth/Decay	y-intercept	Eq'n for Horizontal Asymptote
$y = 2^x - 3$	Growth	(0, -2)	<i>Y</i> = -3
$y = 2(3)^x + 1$	Growth	(0,3)	Y = 1
$y = 20(0.8)^x - 2.4$	Decay	(0, 17.6)	Y = -2.4
$y = 1.7(1.25)^x$	Growth	(0, 1.7)	Y = 0