Name: _____ Period: _____

HW 4-3 HONORS: More Graphs with Vertical Shifts

Score:

_____/_____

_____%

Instructions:
- a) Complete the table of values
- b) Graph. Make sure you label your graph and asymptote.
- c) Identify the *y*-intercept and asymptote for each graph.

1) $f(x) = 2^x + 3$

x	y
-2	$3\frac{1}{4}$
-1	$3\frac{1}{2}$
0	4
1	5
2	7
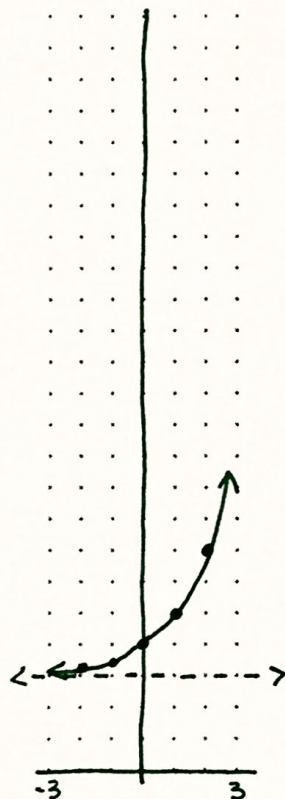
y-intercept: $(0,4)$

asymptote: $y = 3$

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

x	y
-2	
-1	
0	
1	
2	

y-intercept: _____

asymptote: _____

3) $f(x) = 4(3)^x + 1$

x	y
-2	$1\frac{4}{9}$
-1	$2\frac{1}{3}$
0	5
1	13
2	37
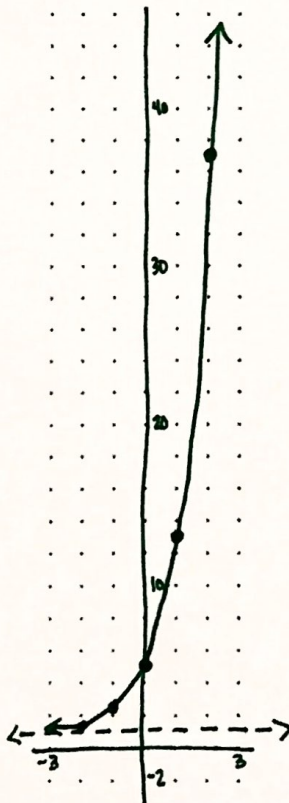
y-intercept: $(0,5)$

asymptote: $y = 1$

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

x	y
-2	
-1	
0	
1	
2	

y-intercept: _____

asymptote: _____

5) $f(x) = -4\left(\dfrac{1}{9}\right)^x$

x	y
-2	-324
-1	-36
0	-4
1	$-\dfrac{4}{9}$
2	$-\dfrac{4}{81}$

y-intercept: $(0, -4)$
asymptote: x-axis
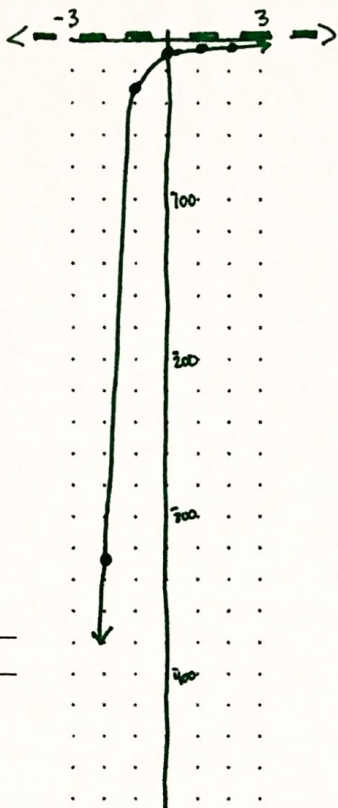
6) $y = 7\left(\dfrac{1}{4}\right)^x + 2$

x	y
-2	
-1	
0	
1	
2	

y-intercept: _____
asymptote: _____

For each problem you are given the parent function $f(x)$ and a second function $g(x)$ that has been shifted vertically.

a) Create a table for both $f(x)$ and $g(x)$ on graph paper.

b) Graph both $f(x)$ and $g(x)$ on the same graph. Use graph paper. Make sure to label your axis and draw the asymptotes.

c) Answer the questions below.

7)
$f(x) = 5^x$ and $g(x) = 5^x - 2$

x	f(x)	g(x)
-2	$\dfrac{1}{25}$	$-1\dfrac{24}{25}$
-1	$\dfrac{1}{5}$	$-1\dfrac{4}{5}$
0	1	-1
1	5	3
2	25	23

What is the y-intercept?
$f(x)$: $(0,1)$ $g(x)$: $(0,-1)$

Where is the asymptote?
$f(x)$: x-axis $g(x)$: $y = -2$

Are these functions increasing or decreasing?
increasing

Are these functions above or below the asymptote?
above

For each problem you are given the parent function $f(x)$ and a second function $g(x)$ that has been shifted vertically.

a) Create a table for both $f(x)$ and $g(x)$ on graph paper.

b) Graph both $f(x)$ and $g(x)$ on the same graph. Use graph paper. Make sure to label your axis and draw the asymptotes.
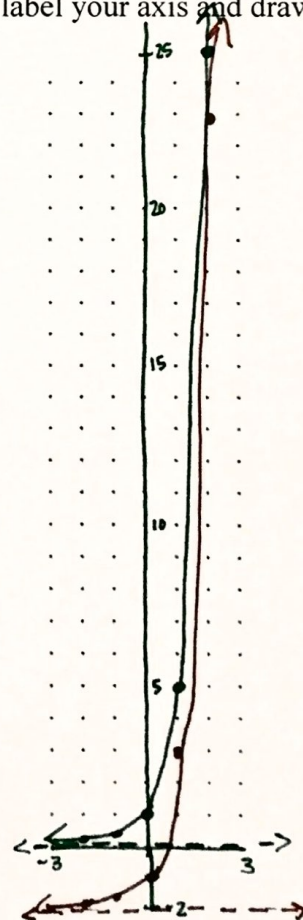
c) Answer the questions below.

8)

$$f(x) = \left(\frac{1}{4}\right)^x \quad \text{and} \quad g(x) = \left(\frac{1}{4}\right)^x - 1$$

What is the y-intercept?

$f(x):$ _____ $g(x):$ _____

Where is the asymptote?

$f(x):$ _____ $g(x):$ _____

Are these functions increasing or decreasing?

Are these functions above or below the asymptote?

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9)

$$f(x) = \left(\frac{1}{5}\right)^x \quad \text{and} \quad g(x) = \left(\frac{1}{5}\right)^x + 1$$

What is the y-intercept?

$f(x):$ _____ $g(x):$ _____

Where is the asymptote?

$f(x):$ _____ $g(x):$ _____

Are these functions increasing or decreasing?

Are these functions above or below the asymptote?

For each problem you are given the parent function $f(x)$ and a second function $g(x)$ that has been shifted vertically.

a) Create a table for both $f(x)$ and $g(x)$ on graph paper.

b) Graph both $f(x)$ and $g(x)$ on the same graph. Use graph paper. Make sure to label your axis and draw the asymptotes.

c) Answer the questions below.

10)

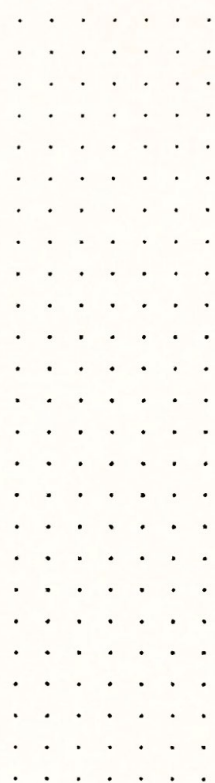$f(x) = -(8)^x$ and $g(x) = -(8)^x + 4$

What is the y-intercept?

$f(x)$: _____ $g(x)$: _____

Where is the asymptote?

$f(x)$: _____ $g(x)$: _____

Are these functions increasing or decreasing?

Are these functions above or below the asymptote?

Identify the y-intercept and asymptote of the function, without graphing.

11) $f(x) = -(6)^x - 4$

     y-intercept: $(0, -5)$

     asymptote: $y = -4$

12) $f(x) = -5(2)^x + 3$

     y-intercept: _____

     asymptote: _____

13) $g(x) = 4^x + 15$

     y-intercept: $(0, 16)$

     asymptote: $y = 15$

14) $y = -8(15)^x + 10$

     y-intercept: _____

     asymptote: _____

15) $y = 6(3)^x - 1$

     y-intercept: $(0, 5)$

     asymptote: $y = -1$

16) $y = 5(6)^x + 2$

     y-intercept: _____

     asymptote: _____

17) $h(x) = -\frac{1}{3}(2)^x - 7$

     y-intercept: $(0, -7\frac{1}{3})$

     asymptote: $y = -7$

18) $y = 27(4)^x - 14$

     y-intercept: _____

     asymptote: _____