

Name: Key

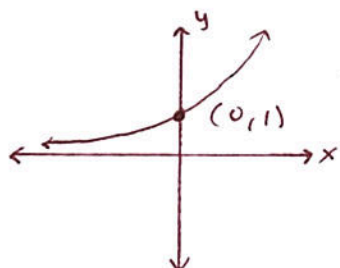
Period: \_\_\_\_\_

**Checkpoint 5B**

*Integrated Math 2*

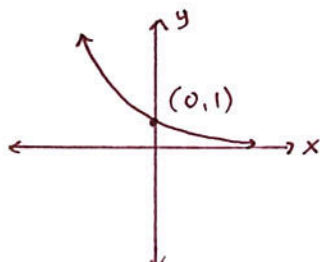
Create a rough sketch of each function. Label any intercepts and write whether it's an increasing or decreasing function.

1)  $y = (1.5)^x$        $1.5^0 = 1$



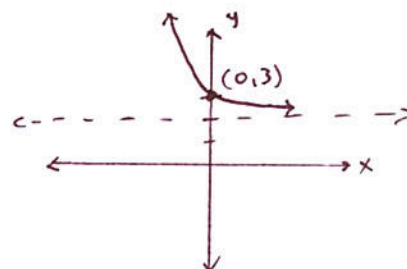
y-int @ 1  
Increasing

2)  $y = \left(\frac{2}{3}\right)^x$        $\left(\frac{2}{3}\right)^0 = 1$



y-int @ 1  
Decreasing

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



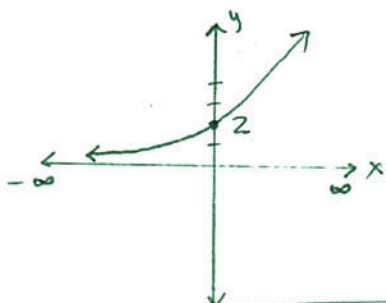
y-int @ 3  
Decreasing

\*\*\* Notice: graphs of 1), 2), and 3) have no x-intercepts \*\*\*

Create a rough sketch of each function. Describe the end behavior using the notation below:

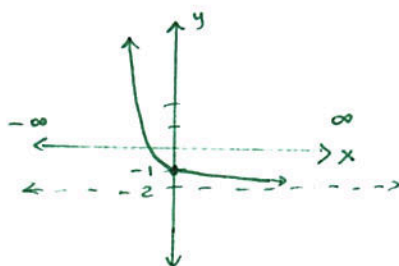
As  $x \rightarrow -\infty$ ,  $f(x) \rightarrow$  \_\_\_\_\_; As  $x \rightarrow +\infty$ ,  $f(x) \rightarrow$  \_\_\_\_\_.

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



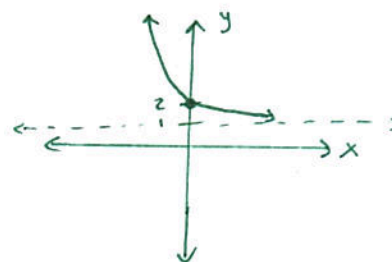
As  $x \rightarrow -\infty$ ,  $f(x) \rightarrow 0$   
As  $x \rightarrow \infty$ ,  $f(x) \rightarrow \infty$

5)  $y = (0.25)^x - 2$



As  $x \rightarrow -\infty$ ,  $f(x) \rightarrow \infty$   
As  $x \rightarrow \infty$ ,  $f(x) \rightarrow -2$

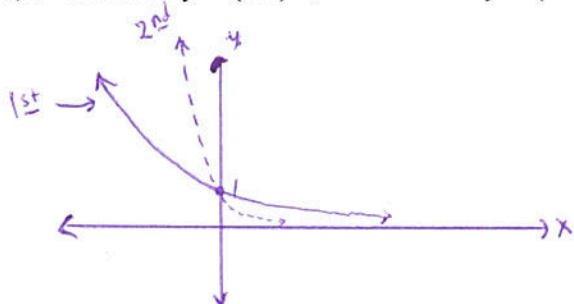
6)  $y = (3)^{-x} + 1$



As  $x \rightarrow -\infty$ ,  $f(x) \rightarrow \infty$   
As  $x \rightarrow \infty$ ,  $f(x) \rightarrow 1$

Graph the first function and then graph the second function. Describe what changes from the first to the second.

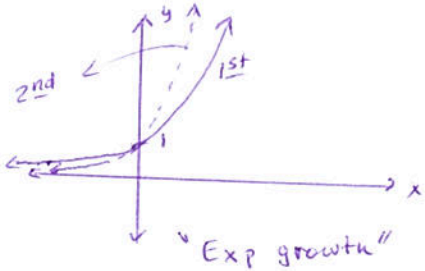
7) 1<sup>st</sup> Function:  $y = (0.8)^x$ ; 2<sup>nd</sup> Function:  $y = (0.2)^x$



Notice As  $x \rightarrow \infty$  (as you move to the right on x-axis), the graph of the 2<sup>nd</sup> function "decays" a lot faster. In other words, the y-values decrease more quickly than y-values of 1<sup>st</sup> function.

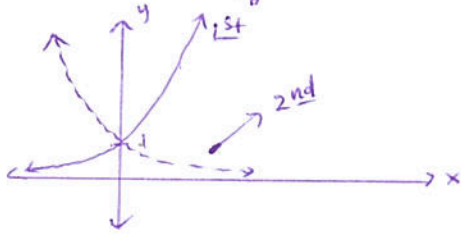
"Both functions are Exp. Decay Functions"

8) 1<sup>st</sup> Function:  $y = (3)^x$ ; 2<sup>nd</sup> Function:  $y = (5)^x$



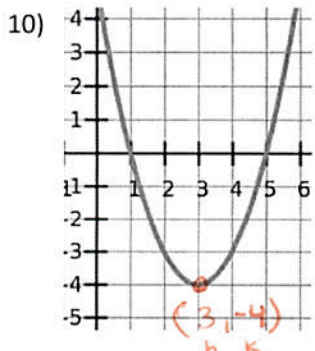
This is opposite problem 7)  
 What changes is that the 2<sup>nd</sup> functions increases faster (or "grows"  
 at a faster pace than 1<sup>st</sup> function)  
 The y-values go up more quickly.

9) 1<sup>st</sup> Function:  $y = (4)^x$ ; 2<sup>nd</sup> Function:  $y = (0.5)^x$

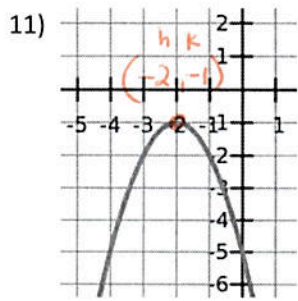


What changes is the growth factor:  $b = 0.5$  in 2<sup>nd</sup> function.  
 The 2<sup>nd</sup> function decays, the 1<sup>st</sup> function grows.

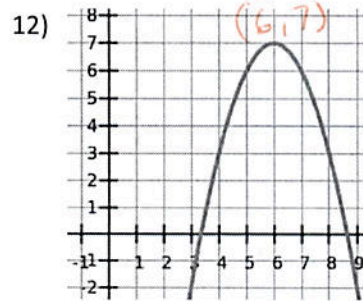
Determine the equation of the graphed parabola. Write it in vertex form:  $y = (x-h)^2 + k$  where the vertex is  $(h, k)$ .



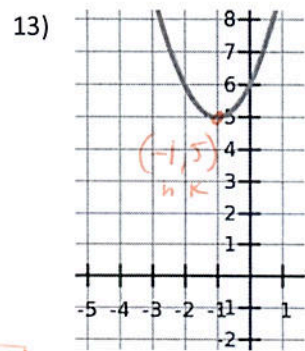
$y = (x-3)^2 - 4$



$y = (x - -2)^2 - 1$   
 So,  $y = (x+2)^2 - 1$



$y = (x-6)^2 + 7$

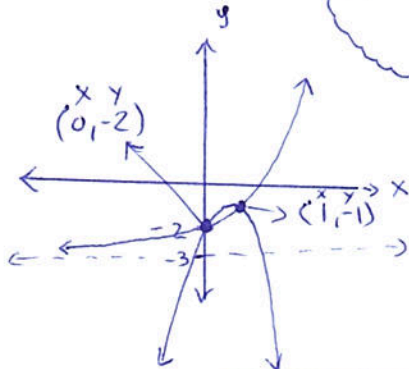


$y = (x - -1)^2 + 5$   
 So,  $y = (x+1)^2 + 5$

Graph the system of equations and label the solutions.

14)  $y = -2x^2 + 3x - 2$   
 $y = 2^x - 3$

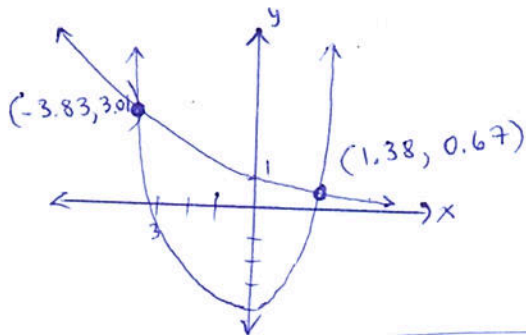
MENU  
 • ANALYZE GRAPH  
 • INTERSECTION  
 ☺



Solutions:  $(0, -2)$ ,  $(1, -1)$   
 OR  
 $x = 0, y = -2$  and  $x = 1, y = -1$

15)  $y = x^2 + 2x - 4$   
 $y = (0.75)^x$

SAME CALC DIRECTIONS AS PROBLEM 14)



Solutions:  $(-3.83, 3.01)$ ,  $(1.38, 0.67)$   
 OR  
 $x = -3.83, y = 3.01$  and  $x = 1.38, y = 0.67$