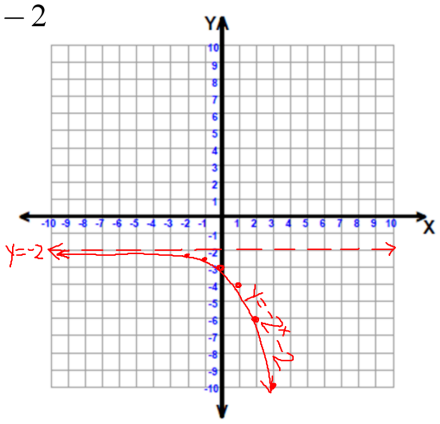
DO NOW

Graph: $y = -2^x - 2$

x	y
-2	-2.25
-1	-2.5
0	-3
1	-4
2	-6
3	-10



9.2 Graphing Exponential Functions - Day 2

exponential function:
↳ function with the variable in the exponent.

parent function: $f(x) = b^x$

asymptote: In an exponential function, it is the horizontal line the graph approaches but never reaches.

y-intercept: In an exponential function, the y-intercept is (0,1) for each parent function.

Negative → reflects in the x-axis
$|a| > 1$ → steeper
$|a| < 1$ → less steep

horizontal slide

$$f(x) = ab^{x-h} + k$$

$b < 1$ reflects in y-axis

vertical slide

Describe the transformations of $y = 2^x$ required for the following functions.

1. $y = 2^{x-3} + 1$
   Shifts right 3 units
   Shifts up 1 unit

2. $y = -2^x - 7$
   reflects in the x-axis
   Shifts down 7 units

3. $y = \left(\frac{1}{2}\right)^{x+2} - 4$
   Shifts left 2 units
   Shifts down 4 units
   reflects in y-axis

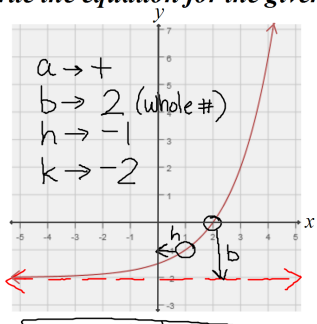
4. $y = 2^{x-1} + 6$
   Shifts right 1 unit
   Shifts up 6 units

Procedure: Writing the name of a graphed exponential function.

1. Look at whether it grows up or down
   ↳ a is positive or negative?
2. Sketch the asymptote.
   ↳ This is k.
3. Locate the graphed grid point that is 1 unit away from the asymptote. Count the distance from y-axis
   ↳ This is h.
4. Go to the next farthest graphed grid point and count its distance from the asymptote. This is b.
   → starts flat - whole #
   → starts climbing - fraction

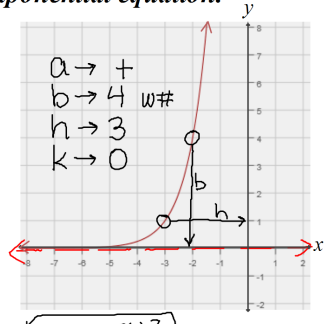
Write the equation for the given exponential equation.

5.



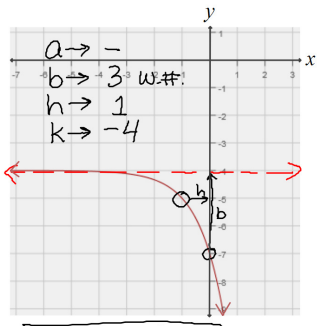
$y = 2^{x-1} - 2$

6.



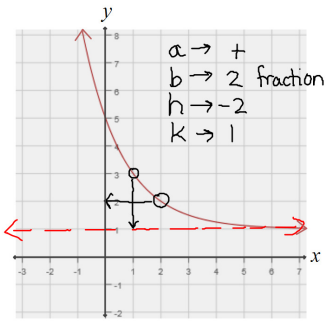
$y = 4^{x+3}$

7.



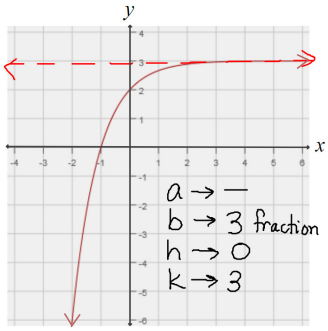
$y = -3^{x+1} - 4$

8.



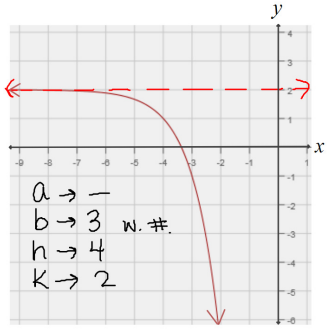
$y = \left(\frac{1}{2}\right)^{x-2} + 1$

9.



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

10.



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

HOMEWORK

Worksheet - HW 9.2 - Day 2