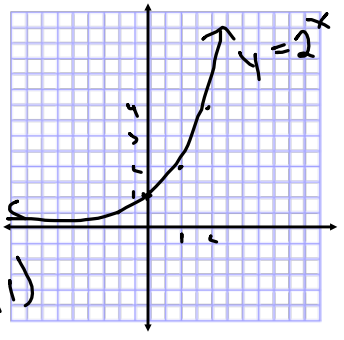
Date: _____

3.6 Exploring Quadratic and Exponential Graphs

Activity #1 : Graphs of Exponential Relations

1. Use a graphing app (Desmos) to graph $y = 2^x$. Copy the table down and accurately sketch the graph.

x	y
-3	1/8
-2	1/4
-1	1/2
0	1
1	2
2	4
3	8



2. Identify the y - intercept for the graph. (0, 1)

3. Are there any x - intercepts? Think about possible reasons for this.
No. The base is 2. There's no way to multiply 2 by itself and get zero.

4. Note any other interesting features of this graph.

5. How is the equation for this exponential relation different from the equation of a quadratic relation ($y = 2^x$ vs. $y = x^2$)
are always positive + increasing ~ makes a 'u', has an x-intercept

Activity #2: Properties of Zero and Negative Exponents

1. Look at your values of y when x was negative in the table (instructions to find the table are in the 3.1 note!) for $y = 2^x$. What does the negative exponent seem to do to the base? Test your theory using a few other numbers.
Flips it and becomes positive. ex $3^{-3} = \left(\frac{1}{3}\right)^3 = \frac{1}{27}$

2. What happens when you raise the base to the exponent zero (what was the value of y when x was zero)? Try raising a few other bases to the exponent zero. What do you notice?
$2^0 = 1$, so $5^0 = 1$, $\left(\frac{7}{10}\right)^0 = 1$ → always 1.

Use your rules to complete p. 182 #3 - 7