Name:-_____ Algebra II- Ms. Mitchell

Exponential Functions

Complete the following worksheet, using the GeoGebra worksheet Exploring Exponential Functions.
Your task consist of studying the graphs of exponential functions $g(x) = a^x$ where a is a real number. Move the slider (or type in the input box the desired value for a) and fill out a table below.

The function $g(x)=a^x$	If there is **a y-intercept** what is it? If there isn't a **y-intercept**, write NONE.	If there is an **x-intercept** what is it? If there isn't an **x-intercept**, write NONE.	Are there any asymptotes? If so, what are they?	Quickly sketch the graph.
$g(x)= .25^x$				
$g(x)=.5^x$				
$g(x)=.75^x$				
$g(x)=1^x$				
$g(x)=e^x$				
$g(x)=5^x$				
$g(x)=30^x$				

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1. Make a conjecture about what you think will happen as the value of a goes to infinity. Using the GeoGebra Worksheet, explain why you think your conjecture is valid.

2. a. What do you notice about the asymptote(s) of the graph $g(x) = a^x$ when $a>1$?

   b. What do you notice about any asymptote(s) of the graph $g(x) = a^x$ what about when $a < 1$?
   c. Make a conjecture about asymptotes of all Exponential Functions.

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3. Make a conjecture about the domain and range of all Exponential functions. Is the domain and range the same for all exponential functions? Does it depend on something? If it does, what does it depend on?

4. Why do you think the value of $a \geq 0$?