**Precalculus Honors  
3.4 Properties of Logarithmic Functions – Practice  
  
I. Assuming x and y are positive, use properties of logarithms to write the expression as a sum  
 or difference of logarithms or multiples of logarithms.**

1. 
2. 
3. 
4. 
5. 
6. 

**II. Assuming x, y, and z are positive, use properties of logarithms to write the expression as a single logarithm.**

1. 
2. 
3. 
4. 
5. 

**III. Use the change-of-base formula and your calculator to evaluate the logarithm.**

1. 
2. 

**IV. Miscellaneous**

1. Write the expression  using only natural logarithms.

1. Write the expression  using only common logarithms.
2. Describe how to transform the graph of into the graph of . Sketch the graph by hand and support with a grapher.
3. Describe how to transform the graph of into the graph of . Sketch the graph by hand and support with a grapher.