Show all your work in answering the following questions. Simply writing the answer is not acceptable. Staple all your pages together. The professor is not responsible for lost pages.

1. Plotting a few points, sketch the following graphs
   
   (a) \( y = 5^x \)
   
   (b) \( y = \log_3 x \)

2. Say whether or not the following functions are well-defined. Motivate your answer by saying why.
   
   (a) \( y = 1.5^x \)
   
   (b) \( y = -1.5^x \)
   
   (c) \( y = \log_{1.5} \sqrt{x} \)
   
   (d) \( y = \log_{-1.5} \frac{\sqrt{x}}{1 + x} \)

3. Write the following expressions in logarithmic form
   
   (a) \( 6^2 = 36 \)
   
   (b) \( 8^{1/3} = 2 \)
   
   (c) \( \left( \frac{1}{2} \right)^{-3} = 8 \)
   
   (d) \( \left( \frac{1}{2} \right)^0 = 1 \)

4. Write each expression as a single logarithm, if possible. At each step, specify which property you are using.
   
   (a) \( \log_3 4 + \log_3 6x \)
   
   (b) \( \log_3 4 + \log_4 3 - 3 \log_3 2 \)

5. Write the following expressions as sum, difference, or multiple of logarithms, using the properties of logarithms. At each step, specify which property you are using.
   
   (a) \( \log_6 \frac{1}{36x^2} \)
   
   (b) \( \log_3 \frac{1}{\sqrt{3x}} \)