**Instead of HW …**

1. State the definition or meaning of the following terms:

1. What is the relation between the derivative of the inverse function and the derivative of the function?
2. What is the definition of *ln(x)*, *sin-1(x)*, *cos-1 (x)*, and *tan-1 (x).* What is their derivative?  
   *ln(x)*  
   *sin-1(x)*,  
    *cos-1 (x)*  
     
    *tan-1 (x).*

1. What is “logarithmic differentiation” and when is it helpful?
2. What is “exponential growth” and “exponential decay”?

2. Find the derivatives of the following functions.













3. Simplify the following expressions

4. The half-life or radium-226 is 1590 years. A sample of radium-226 has a mass of 200 mg. Find a formula about how much of the substance remains after t years. Find the mass after 3000 years. Also, find out how long it takes until the original mass is reduced to 100 mg.

5. At 9am a researcher put a petri dish with 100 cells into an incubator. She checked back at 11am to find the number of cells had grown to 2000. The next time she checked her cell culture was just before she wanted to go home at 5pm. Assuming exponential growth, how many cells did she find at the end of the day?

6. Graph the function , complete with domain, relative max/min, inflection points, asymptotes, etc. – the works

7. Find the inverse function for the following functions:

8. Which of the following functions have an *inverse* function? For those who do, sketch the inverse. Note that the blue line indicates the main diagonal, for reference.