1. [5 points] Use logarithmic differentiation to find $y'$ if $y = (\sin x)^x$. 
2. [5 points] The half-life of cesium-137 is 30 years. If you have a 200-mg sample how much of the sample remains after 75 years? Simplify your answer. Leave only radicals in it (no logarithms, no exponents).
bonus problem [5 points extra] Solve the equation $3^{2^x} = 2^{3^x}$. Leave logarithms in your answer.