QUIZ 8 - MATH 112 Friday, November 2

YOUR NAME:_____ George Voutsadakis

Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. (a) Solve the exponential equation

$$(3^x)^{x^2} = 27^{3x}.$$

(b) Solve the logarithmic equation

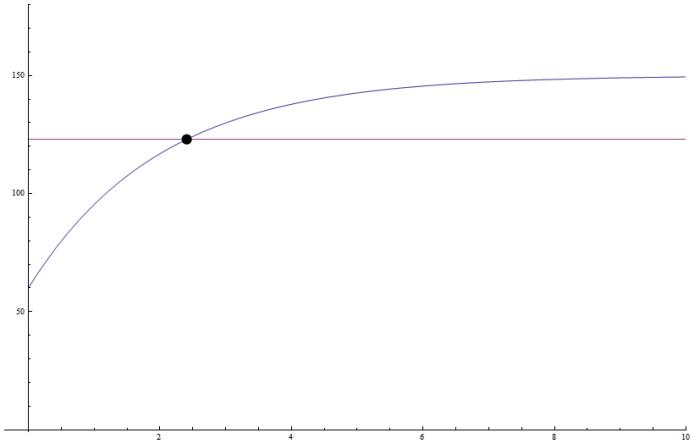
$$\log_{2019} x + \log_{2019} (x-1) = \log_{2019} (x+8).$$

2. The population in the wild of a certain species t years from now is modeled by the equation

$$P(t) = 30(5 - 3e^{-\frac{1}{2}t}) \quad \text{(in thousands of individuals).}$$

(a) How many individuals are currently in the population (show all steps; do not just read from the graph)?

(b) When will the population reach 123,000 individuals?



(c) How fast will the population be changing in 2 years time?

3. Your grandparents were very forward looking and pro-education and deposited in 1978 a certain capital at an account yielding 4% compounded monthly so that in 2018 the account would have \$60,000.

   Your parents took that amount in 2018 and put it in a new account yielding 3% compounded semiannually so that you and your siblings may use it for the education of your own kids in the future.

   (a) Find how much your grandparents deposited in 1978.

   (b) Find in how many years from now the account your parents created will have \$90,000 in it.