## QUIZ 9 - MATH 111 YOUR NAME:

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. Suppose that you have given the following information:

 $\log_a x = -0.36, \qquad \log_a y = -0.56, \qquad \log_a z = -0.83.$ 

Find the value of the expression:

$$\log_a\left(\frac{y^3\sqrt[3]{x^2}}{z^2}\right) =$$

2. Solve exactly (do not use calculators; decimal approximation not acceptable) the equation

$$7^{x-2} = 4^{x+3}$$

3. For certain decisions, the time it takes to respond is a logarithmic function of the number of choices faced. One model is

$$R = 0.17 + 0.44 \log N,$$

where R is the reaction time in seconds and N is the number of choices.

(a) Draw neatly a graph of R vs N, including values for up to 10 choices.

- (b) Express using functional notation the reaction time when there are 7 choices and then calculate its value.
- (c) If a person has at most 0.55 seconds in which to respond, how many choices can (s)he handle at the most? Show ALL your work giving an exact answer (not a decimal).

(d) Suppose that the number of choices a person faces increase by 10. What happens then to his/her reaction time? Show ALL work giving an exact answer (not a decimal).

(e) If Kate has available 0.4 seconds more than Ben in which to respond, how many more choices than Ben can (s)he handle Again, show ALL your work.