UNIT 5 WORKSHEET 10
Exponential and Logarithmic Equations Worksheet 2

Solve each of the following. (Round answers to 3 decimal places)

1) $\log_x 12 = 3$

2) $3^{4x-5} = 5^{2x+1}$

3) $4 + 3e^{2x+1} = 8$

Use the properties of logs and the following values to evaluate numbers 4-6.

$\log_a 2 \approx 0.2544$

$\log_a 3 \approx 0.5646$

$\log_a 5 \approx 0.8271$

4) $\log_a 54$

5) $\log_a \dfrac{12}{5}$

6) $\log_a 160$

Use a calculator to evaluate each of the following. (Round to three decimal places)

7) $\log_3 15$

8) $\log_7 56$

9) $\ln 5$

Solve each of the following logarithmic equations. (Round any solutions with decimals to three decimal places)
Always check for extraneous roots!!!

10) $\log_3(x+5) + \log_3(x+3) = \log_3 35$

11) $2\log_3 x - \log_3(x-2) = 2$

12) $\log_2(x+3) + \log_2(x-3) = 4$

13) $\log_3(x+5) + \log_3(x+3) = \log_3 35$

14) If you invest $2500 in an account that pays 12% interest, compounded quarterly, how much would you have at the end of 17 years?

15) How much would you have to invest in an account that pays 6% interest, compounded monthly, to have a balance of $30,000 at the end of 10 years?

16) How long will it take for an investment of $2,000 in an account that pays $8\frac{1}{2}$% interest compounded quarterly to become $15,000.

17) The demand equation for a certain clock radio is given by $p = 400 - .06e^{0.003x}$. Find the demand, x, for the price of $p = \$99$.

18) The population, P, where P is measured in thousands, of one city is given by $P = 30e^{kt}$. In this particular model, $t = 0$ represents the year 2000. In 1990, the population was 52,000. Find the value of k and use the result to estimate the population of the city in the year 2012.

19) On the Richter scale, the magnitude R of an earthquake with intensity I is measured by

$$R = \log_{10} \frac{I}{I_0}$$

Where $I_0 = 1$ is the minimum intensity used for comparison.

A) Find the intensity of an earthquake that measures 6.5 on the Richter scale.

B) Find the intensity of an earthquake the measures 3.2 on the Richter scale.

C) Find the magnitude of an earthquake that has an intensity of 325,000.