NAME: Solution

MAC 1147 Section 3079
Quiz Seven

Please show all of your work in a NEAT and ORGANIZED fashion.

1. (3 points) Condense the following expression to the logarithm of a single quantity:

$$2\Big[\log x + \log(x+4)\Big] - \frac{1}{3}\log(x+2) =$$

$$2\log\left[x(x+4)\right] - \tfrac{1}{3}\log(x+2) =$$

$$\log\left[x(x+4)\right]^2 - \log\sqrt[3]{x+2} =$$

$$\log\left[\frac{(x^2)(x+4)^2}{\sqrt[3]{x+2}}\right]$$

2. (3 points) Solve the logarithmic equation algebraically. (Give the exact solution; do not approximate.)

$$\ln\sqrt{x-8} = 5$$

$$e^{\ln\sqrt{x-8}} = e^5$$

$$\sqrt{x-8} = e^5$$

$$x-8 = (e^5)^2 = e^{10}$$

$$x = 8 + e^{10}$$

3. (3 points) Suppose you invest \$300 in an account at an annual interest rate of 6%, compounded continuously. Find the time required for the amount to double. (Give the exact solution; do not approximate.)

$A = Pe^{rt} = 300e^{0.06t} \longrightarrow 600 = 300e^{0.06t}$

$$2 = e^{0.06t}$$

$$\ln 2 = \ln\left(e^{0.06t}\right)$$

$$\ln 2 = 0.06t$$

$$t = \frac{\ln 2}{0.06} \text{ years}$$