Worksheet -- Section 5.4 -- Solving Exponential and Logarithmic Equations.

1. Use the inverse properties of logarithms and exponentials to simplify the expressions:

a) $\ln(e^x)$

b) $\ln(e^{5x})$

c) $\ln(e^{x^2})$

d) $\ln(e^{x^2+5x})$

e) $\log(10^{x^2})$

f) $\log(10^{x^2+1})$

g) $\log(e^{x^2})$

h) $e^{\ln(x)}$

i) $e^{\ln(2x)}$

j) $e^{\ln(x^2)}$

k) $e^{\ln(x+5)}$

l) $e^{\ln(2x+x^2)}$

2. Use algebra to solve the following equations:

a) $e^{3x} = 12$

b) $6\,e^{3x} = 12$

c) $6 + e^{3x} = 12$

d) $6 + 4\,e^{3x} = 12$

e) $\ln(x) = 2$

f) $\ln(3\,x) = 2$

g) $5 \ln(x) = 2$

h) $5 \ln(3x) = 2$

i) $5 \ln(3x + 1) = 2$

j) $\log(x + 2) = 1$

k) $10^{x+2} = 1000$

3. Suppose you invest 5000 dollars, compounded continously($A = P\,e^{rt}$) at interest rate 12%. How long will it take for your investment to double in value?

4. Suppose you invest 5000 dollars, compounded continously at interest rate 12%. How long will it take for your investment to triple in value?