

## Algebra II Worksheet #6 Unit 11 Selected Solutions

Solve for x. Express your solutions rounded to the nearest hundredth.

3.  $e^{(x-3)} = 100$

$$\ln(e^{(x-3)}) = \ln 100$$

$$(x-3)\ln e = \ln 100$$

$$x-3 = \ln 100$$

$$x = (\ln 100) + 3 \approx 7.61$$

6.  $e^{(5x+1)} = 600$

$$\ln(e^{(5x+1)}) = \ln 600$$

$$(5x+1)\ln e = \ln 600$$

$$5x+1 = \ln 600$$

$$5x = (\ln 600) - 1$$

$$x = \frac{(\ln 600) - 1}{5} \approx 1.08$$

12.  $6^{(2x+1)} = 4^{(x+3)}$

$$\text{Log}(6^{(2x+1)}) = \text{Log}(4^{(x+3)})$$

$$(2x+1)\text{Log } 6 = (x+3)\text{Log } 4$$

$$2x\text{Log } 6 + \text{Log } 6 = x\text{Log } 4 + 3\text{Log } 4$$

$$2x\text{Log } 6 - x\text{Log } 4 = 3\text{Log } 4 - \text{Log } 6$$

$$(2\text{Log } 6 - \text{Log } 4)x = 3\text{Log } 4 - \text{Log } 6$$

$$x = \frac{3\text{Log } 4 - \text{Log } 6}{2\text{Log } 6 - \text{Log } 4} \approx 1.08$$

15.  $\ln x = 3.1$

$$x = e^{3.1} \approx 22.20$$

16.  $\text{Log}_3 x = 1.25$

$$x = 3^{1.25} \approx 3.95$$

19.  $\text{Log } x = 1.75$

$$x = 10^{1.75} \approx 56.23$$

Use the change of base formula to find each of the following logarithms. Express your answers rounded to the nearest hundredth.

22.  $\text{Log}_3 5 \approx \underline{1.46}$

$$\frac{\text{Log } 5}{\text{Log } 3} \text{ or } \frac{\ln 5}{\ln 3}$$

26.  $\text{Log}_5 3000 \approx \underline{4.97}$

$$\frac{\text{Log } 3000}{\text{Log } 5} \text{ or } \frac{\ln 3000}{\ln 5}$$

Solve the following problems.

31. Money is deposited in an account that pays interest at an annual rate of 2.5% compounded continuously. How long will it take for the value of the account to triple? Express your answer rounded to the nearest tenth of a year.

$$A = Pe^{Rt}$$

$$A = 3P$$

$$R = 0.025$$

$$3P = Pe^{0.025t}$$

$$e^{0.025t} = 3$$

$$0.025t = \ln 3$$

$$t = \frac{\ln 3}{0.025} \approx 43.9$$

**It will take about 43.9 years.**