Name: _____ Date: _____

7.4 Techniques for Solving Logarithmic Equations

BLM 7–6

1. Solve algebraically.

a) $\log(x+5)=2$

b) $1-2\log(p-8)=0$

c) $\log_2(m+12)=4$

2. Use Technology Solve using graphing technology.

a) $\log(x-2)=1$

b) $2-\log(v+1)=0$

3. Solve. Identify and reject any extraneous roots.

a) $\log_2(x-5)+\log_2(x-2)=2$

b) $\log x+3=\log(10x^3)$

c) $2\log m+3\log m=10$

4. Solve. Check for extraneous roots.

a) $\log(x+5)^3=3$

b) $\log\sqrt{x^2-5x+9}=1$

5. Solve.

a) $\log_2 x+\log_2(x-3)=2$

b) $\log(x+2)=2-\log(x-3)$

6. Use Technology Find the roots of each equation, correct to two decimal places, using graphing technology. Sketch the graphical solution.

a) $\log x=1+\log(x-2)$

b) $4\log(x+1)-5=\log(x)-2$

7. The number of years, *n*, required for an investment P_1 to grow to amount P_2 when interest is *i*% per year (expressed as a decimal) is given by the formula $n=\dfrac{\log P_2-\log P_1}{\log(1+i)}$.

a) How many years does it take for \$1500 to grow to \$2380 at a yearly interest rate of 8%?

b) How much should be invested, to the nearest dollar, in order for it to grow to be \$4137 in 8 years at a yearly rate of 5%?

c) What yearly interest rate is needed to allow \$900 to grow to \$1689 in 10 years, to the nearest tenth of a percent?

8. Solve $\log_2\sqrt{x}+\log_4 x=5$.

9. a) Calculate $(\log_2 5)(\log_5 8)(\log_8 10)$.

b) Compare your answer from part a) to $\log_2 10$.

c) Prove that $(\log_a b)(\log_b c)(\log_c d)=\log_a d$.