5.5 Practice – Solving Exponential and Logarithmic Equations

Name _____ Date _____ Period _____

Solve the following logarithmic equations.

1. $\log_2 x = \log_2 10 - \log_2 5$

2. $\log_{10} x = \frac{1}{2}\log_{10} 81 - \frac{1}{3}\log_{10} 27$

3. $\log_7 x = 4\log_7 2 + (\log_7 3 - \log_7 6)$

4. $3\log_{10} x = \log_{10} 12 + \log_{10} 18$

5. $\log_{10} 3x = \log_{10} 12 + 2(\log_{10} 5 - \log_{10} 2)$

Solve the following logarithmic equations.

6. $\log_3 x + \log_3 (x-8) = 2$

7. $\log_2 (x+3) + \log_2 (x-3) = 4$

8. $\log_7 (x-5) + \log_7 (x+1) = 1$

9. $\log_{10} x + \log_{10} (x+9) = 1$

10. $\log 72 - \log\left(\frac{2x}{3}\right) = 0$

11. $\log_{10}(x-9) - \log_{10} x = 1$

12. $\log_6(x+2) = 1 - \log_6(x-3)$

13. $\log_6(x+2) = 1 + \log_6(x-3)$

14. $\log_{10}\sqrt[3]{x^2} + \log_{10}\sqrt[3]{x^4} = \log_{10} 2^{-3}$ (Hint: Think fractional exponents)

15. $2^{2\log_2 6 - \log_2 12} = x$ (Hint: Convert to the inverse of exponents)