Section 7.5   Algebra 2   Name _____
Worksheet   Period _____

Rewrite each side of the equation with the same base. Once the bases are the same, then the exponents must be equal. Set the exponents equal to each other and solve for x.

1. $4^{3x-1} = 8^{x-1}$ 2. $9^{2x+1} = 27^{x-3}$

3. $25^{4x-7} = 125^{x-8}$ 4. $4^{2x} = 32^{x-3}$

Solve by taking the logarithm of each side, then use the properties of logarithms and the properties of equality to solve for x.

5. $2^x = 3$ 6. $4^x = 20$

7. $5^{x+1} = 24$ 8. $4^{x-2} = 90$

9. $6^{3x-2} = 30$ 10. $12^{2x-1} = 120$

Problems 11 and 12 require you to isolate the exponential term first, then take the logarithm of each side and solve for x.

11. $8+10^x = 1008$

12. $5-3^x = -40$

Simplify using the properties of logarithms. No calculator should be necessary.

13. $\log_6 1 =$

14. $\log_7 7 =$

15. $\log_9 3 =$

16. $\log_3 9^4 =$

17. $14^{\log_{14} x} =$

18. $\log_5 5 =$

19. $\log 10 =$

20. $7^{\log_7 8} =$

Use the change of base formula to find the value of the following to the nearest hundredth.

21. $\log_6 20 =$

22. $\log_{12} 8 =$