Worksheet 8.5

Use the change of base formula to evaluate each. Round to the nearest ten-thousandth (four decimal places.)

1. $\log_2 9$ 2. $\log_4 8$ 3. $\log_3 54$ 4. $\log_{1/2} 10$

5. $\log_3 50$ 6. $\log_8 5$ 7. $\log_{4.6} 12.5$ 8. $\log_\pi e$

Solve each equation using logarithms. Round to the nearest ten-thousandth.

9. $2^x = 3$ 10. $5^x = 81.2$ 11. $3^x = 27.3$ 12. $8 + 10^x = 1008$

13. $9^{2y} = 66$ 14. $14^{x+1} = 36$ 15. $2^{3x-4} = 5$ 16. $6(2^x) = 50.1$

17. $0.76(5^{2x}) = 29.3$ 18. $8.35(3^{-x}) = 4780$
19. $3^{x-1} = 2^{x+1}$ 20. $8^{2x-1} = 39^{x+1}$

Solve without logarithms.

21. $4^x = 2^{x+3}$ 22. $125^{2x-2} = 25^{3-x}$ 23. $8^{x+3} = (1/4)^{3x-6}$

Solve by graphing (the only way to solve these.) Find all solutions.

24. $3^x = x^2$ 25. $2^x = x^3 + 3x^2 - x - 2$

Answers:

1. 3.1699
2. 1.5
3. 3.6309
4. -3.3219
5. 3.5609
6. 0.7740
7. 1.6551
8. 1.1447
9. 1.5850
10. 2.7320
11. 3.0101
12. 3
13. 0.9534
14. 0.3579
15. 2.1073
16. 3.0618
17. 1.1346
18. -5.7800
19. 4.4190
20. 11.5945
21. 3
22. 3/2
23. 1/3
24. -0.6860
25. -3.1024, -0.8850, 1.1355