

# Practice 8-5

## Exponential and Logarithmic Equations

Use the Change of Base Formula to evaluate each expression. Round answers to the nearest hundredth.

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|----------------|----------------|---------------|---------------|----------------|
| 1. $\log_2 12$ | 2. $\log_3 40$ | 3. $\log_4 8$ | 4. $\log_5 3$ | 5. $\log_2 1$  |
| 6. $\log_5 10$ | 7. $\log_2 8$  | 8. $\log_3 6$ | 9. $\log_9 3$ | 10. $\log_8 3$ |

Solve each equation. Check your answer. Round answers to the nearest hundredth.

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|-------------------|------------------|-----------------------|--------------------|
| 11. $2^x = 243$   | 12. $7^n = 12$   | 13. $5^{2x} = 20$     | 14. $8^{n+1} = 3$  |
| 15. $4^{n-2} = 3$ | 16. $4^{3n} = 5$ | 17. $15^{2n-3} = 245$ | 18. $4^x - 5 = 12$ |

Solve each equation. Check your answer. Round answers to the nearest hundredth.

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|------------------------------|-----------------------------|----------------------------------|
| 19. $\log 3x = 2$            | 20. $4 \log x = 4$          | 21. $\log (3x - 2) = 3$          |
| 22. $2 \log x - \log 5 = -2$ | 23. $\log 8 - \log 2x = -1$ | 24. $\log (x + 21) + \log x = 2$ |
| 25. $8 \log x = 16$          | 26. $\log x = 2$            | 27. $\log 4x = 2$                |
| 28. $\log (x - 25) = 2$      | 29. $2 \log x = 2$          | 30. $\log 3x - \log 5 = 1$       |

Use a table to solve each equation. Round answers to the nearest hundredth.

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|----------------------|-------------------|-----------------------|----------------------|
| 31. $10^x = 182$     | 32. $8^n = 12$    | 33. $10^{2x} = 9$     | 34. $5^{n+1} = 3$    |
| 35. $10^{n-2} = 0.3$ | 36. $3^{3n} = 50$ | 37. $10^{2n-5} = 500$ | 38. $11^x - 50 = 12$ |

The function  $y = 1000(1.005)^x$  models the value of \$1000 deposit at 6% per year (0.005 per month)  $x$  months after the money is deposited.

39. Use a graph (on your graphing calculator) to predict how many months it will be until the account is worth \$1100.
40. Predict how many years it will be until the account is worth \$5000.

Solve each equation. Round answers to the nearest hundredth.

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|------------------------------|-----------------------------|-----------------------------|
| 41. $2 \log 3x - \log 9 = 1$ | 42. $\log x - \log 4 = -1$  | 43. $\log x - \log 4 = -2$  |
| 44. $\log x - \log 4 = 3$    | 45. $2 \log x - \log 4 = 2$ | 46. $\log (2x + 5) = 3$     |
| 47. $2 \log (2x + 5) = 4$    | 48. $\log 4x = -1$          | 49. $2 \log x - \log 3 = 1$ |

Solve by graphing. Round answers to the nearest hundredth.

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|----------------|-------------------|---------------------|
| 50. $10^n = 3$ | 51. $10^{3y} = 5$ | 52. $10^{k-2} = 20$ |
| 53. $5^x = 4$  | 54. $2^{4x} = 8$  | 55. $3^{x+5} = 15$  |