

# Homework 2.5/2.6: Solving Logarithms



**Directions:** 2.5 Hwk Assg problems 1-20. Show all work on a separate sheet of paper!  
 2.6 Hwk Assg problems 21-38. show all work on a separate sheet of paper!

In exercises 1 to 20, solve each logarithmic equation for x.

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|---|---|
| 1. $\log_4 x = 3$                         | 2. $\log_3 x = -2$                              |
| 3. $\log(x + 1) = 2$                      | 4. $\log_5(2x - 1) = 2$                         |
| 5. $\log_2 x + \log_2 8 = 6$              | 6. $\log 5 + \log x = 2$                        |
| 7. $\log_3 x - \log_3 6 = 3$              | 8. $\log_4 x - \log_4 8 = 3$                    |
| 9. $\log_2 x + \log_2(x + 2) = 3$         | 10. $\log_3 x + \log_3(2x + 3) = 2$             |
| 11. $\log_7(x + 1) + \log_7(x - 5) = 1$   | 12. $\log_2(x + 2) + \log_2(x - 5) = 3$         |
| 13. $\log x - \log(x - 2) = 1$            | 14. $\log_5(x + 5) - \log_5 x = 2$              |
| 15. $\log_3(x + 1) - \log_3(x - 2) = 2$   | 16. $\log(x + 2) - \log(2x - 1) = 1$            |
| 17. $\log(x + 5) - \log(x - 2) = \log 5$  | 18. $\log_3(x + 12) - \log_3(x - 3) = \log_3 6$ |
| 19. $\log_2(x^2 - 1) - \log_2(x - 2) = 3$ | 20. $\log(x^2 + 1) - \log(x - 2) = 1$           |

In exercises 21 to 38, solve each exponential equation for x. Give your solutions in decimal form, correct to three decimal places.

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|-----------------------------|--------------------------|
| 21. $5^x = 625$             | 22. $4^x = 64$           |
| 23. $2^{x+1} = \frac{1}{8}$ | 24. $9^x = 3$            |
| 25. $8^x = 2$               | 26. $3^{2x-1} = 27$      |
| 27. $3^x = 7$               | 28. $5^x = 30$           |
| 29. $4^{x+1} = 12$          | 30. $3^{2x} = 5$         |
| 31. $7^{3x} = 50$           | 32. $6^{x-3} = 21$       |
| 33. $5^{3x-1} = 15$         | 34. $8^{2x+1} = 20$      |
| 35. $4^x = 3^{x+1}$         | 36. $5^y = 2^{y+2}$      |
| 37. $2^{x+1} = 3^{x-1}$     | 38. $3^{2x+1} = 5^{x+1}$ |

**ANSWERS**

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|--------------------------------------|---------------------------------------|
| 1. <u>64</u>                         |                                       |
| 2. <u><math>\frac{1}{9}</math></u>   |                                       |
| 3. <u>99</u>                         |                                       |
| 4. <u>13</u>                         |                                       |
| 5. <u>4</u>                          |                                       |
| 6. <u>20</u>                         |                                       |
| 7. <u>162</u>                        | 8. <u>512</u>                         |
| 9. <u>2</u>                          | 10. <u>1.5</u>                        |
| 11. <u>6</u>                         | 12. <u>6</u>                          |
| 13. <u><math>\frac{20}{9}</math></u> | 14. <u><math>\frac{5}{24}</math></u>  |
| 15. <u><math>\frac{19}{8}</math></u> | 16. <u><math>\frac{12}{19}</math></u> |
| 17. <u><math>\frac{15}{4}</math></u> | 18. <u>6</u>                          |
| 19. <u>3.5</u>                       | 20. <u>7.3</u>                        |
| 21. <u>4</u>                         | 22. <u>3</u>                          |
| 23. <u>-4</u>                        | 24. <u><math>\frac{1}{2}</math></u>   |
| 25. <u><math>\frac{1}{3}</math></u>  | 26. <u>2</u>                          |
| 27. <u>1.771</u>                     | 28. <u>2.113</u>                      |
| 29. <u>.792</u>                      | 30. <u>.732</u>                       |
| 31. <u>.670</u>                      | 32. <u>4.699</u>                      |
| 33. <u>.894</u>                      | 34. <u>.220</u>                       |
| 35. <u>3.819</u>                     | 36. <u>1.513</u>                      |
| 37. <u>4.419</u>                     | 38. <u>.869</u>                       |