

Solve each equation. Check your solutions.

36. $\log_3 6 + \log_3 x = \log_3 12$ **2**

38. $\log_{10} 18 - \log_{10} 3x = \log_{10} 2$ **3**

40. $\log_2 n = \frac{1}{3} \log_2 27 + \log_2 36$ **108**

37. $\log_4 a + \log_4 8 = \log_4 24$ **3**

39. $\log_7 100 - \log_7 (y + 5) = \log_7 10$ **5**

41. $3 \log_{10} 8 - \frac{1}{2} \log_{10} 36 = \log_{10} x$ **$85\frac{1}{3}$**

Solve for n .

42. $\log_a 6n - 3 \log_a x = \log_a x$ **$\frac{x^4}{6}$**

43. $2 \log_b 16 + 6 \log_b n = \log_b (x - 2)$ **$\left(\frac{x-2}{256}\right)^{\frac{1}{6}}$**

Solve each equation. Check your solutions. **46. no solution**

44. $\log_{10} z + \log_{10} (z + 9) = 1$ **1**

45. $\log_3 (a^2 + 3) + \log_3 3 = 3$ **$\sqrt{6}, -\sqrt{6}$**

46. $\log_2 (15b - 15) - \log_2 (-b^2 + 1) = 1$

47. $\log_4 (2y + 2) - \log_4 (y - 2) = 1$ **5**

48. $\log_6 0.1 + 2 \log_6 x = \log_6 2 + \log_6 5$ **10**

49. $\log_7 64 - \log_7 \frac{8}{3} + \log_7 2 = \log_7 4p$ **12**

State whether each equation is *true* or *false*.

51. $\log_8 (x - 3) = \log_8 x - \log_8 3$ **false**

52. $\log_5 22x = \log_5 22 + \log_5 x$ **true**

53. $\log_{10} 19k = 19 \log_{10} k$ **false**

54. $\log_2 y^5 = 5 \log_2 y$ **true**

55. $\log_7 \frac{x}{3} = \log_7 x - \log_7 3$ **true**

56. $\log_4 (z + 2) = \log_4 z + \log_4 2$ **false**

57. $\log_8 p^4 = (\log_8 p)^4$ **false**

58. $\log_9 \frac{x^2 y^3}{z^4} = 2 \log_9 x + 3 \log_9 y - 4 \log_9 z$ **true**

65. WHICH ONE DOESN'T BELONG? Find the expression that does not belong. Explain.

$$\log_b 24 = \log_b 2 + \log_b 12$$

$$\log_b 24 = \log_b 20 + \log_b 4$$

$$\log_b 24 = \log_b 8 + \log_b 3$$

$$\log_b 24 = \log_b 4 + \log_b 6$$