

Logarithms and Exponential Equations

Simplify:

- $\log_4 4$
- $\log_5 25$
- $\log_2(\frac{1}{4})$
- $\log_7(\frac{1}{7})$
- $\log_{219}(1)$
- $2 \log_2(16)$
- $5 \log_3(\frac{1}{3})$
- $-4 \log_{10}(\frac{1}{1000})$
- $217 \log_{568}(1)$

Solve for x .

- $3^x = 9$
- $2^x = 8$
- $6^{2x} = 36$
- $17^x = 1$
- $4^{2-x} = 64$
- $5^{6x-1} = 25$
- $8^x = 4^{x+1}$
- $9^{x+1} = 27^x$
- $4^{3x} = 32^{x+1}$
- $2^x = \frac{1}{4}$
- $29^{2x-4} = 1$
- $3^x = \frac{1}{3}$
- $\frac{1}{4^x} = 4$
- $(\frac{1}{5})^x = 25$
- $\frac{1}{2^x} = \frac{1}{16}$
- $(\frac{1}{3})^{3-3x} = \frac{1}{27}$
- $\frac{1}{e^{x+1}} = e^2$
- $\frac{2^3}{2^{x-1}} = 2$
- $\frac{e^{2x}}{e^{x+1}} = e$
- $5^x = 2$
- $5 + 4^x = 12$
- $2 \cdot 2^x = 18$
- $4 - 6^x = -2$
- $4 - 7 \cdot 3^x = -31$
- $10 = 1 + 3 \cdot e^x$
- $34 = 16 + 2 \cdot 3^x$
- $9^{x+4} = 27^{5x-3}$
- $3(2 + e^{x/4}) = 27$
- $2^{x+2} = 3$
- $7 - 2e^{7x+5} = 3$
- $4^{4x-3} - 1 = 15$
- $(\frac{1}{7})^x = 49^{x+6}$
- $16^{2-3x} = 32^{5x+1}$
- $3 - \frac{9^{x+2}}{9^7} = 2$
- $5 - (3 + e^{x/2}) = -1$
- $3 = 2 + \frac{4^{x+1}}{4^2}$
- $5 = -1 + 2(1 + e^{x/3})$

Answers:

1. 1
2. 2
3. -2
4. -1
5. 0
6. 8
7. -5
8. 12
9. 0
10. 2
11. 3
12. 1
13. 0
14. -1
15. $\frac{1}{2}$
16. 2
17. $\frac{1}{2}$
18. 5
19. -2
20. 2
21. -1
22. -1
23. -2
24. 4
25. 0
26. -3
27. 3
28. 2
29. $\log_5 2$
30. $\log_4 7$
31. $\log_2 9$
32. 1
33. $\log_3 5$
34. $\ln 3$
35. 2
36. $\frac{17}{13}$
37. $4 \ln 7$
38. $-2 + \log_2 3$
39. $\frac{\ln 2 - 5}{7}$
40. $\frac{5}{4}$
41. -4
42. $\frac{3}{37}$
43. 5
44. $2 \ln 3$
45. 1
46. $3 \ln 2$