Instructor: Dr. R.A.G. Seely 11th Practice Assignment

Algebra & Functions (Maths 201–016)

Exponential and Logarithmic Equations

Solve for x.

1. $3^x = 9$
2. $2^x = 8$
3. $6^{2x} = 36$
4. $17^x = 1$
5. $4^{2-x} = 64$
6. $5^{6x-1} = 25$
7. $8^x = 4^{x+1}$
8. $9^{x+1} = 27^x$
9. $4^{3x} = 32^{x+1}$
10. $2^x = \frac{1}{4}$
11. $29^{2x-4} = 1$
12. $3^x = \frac{1}{3}$
13. $\frac{1}{4^x} = 4$
14. $(\frac{1}{5})^x = 25$
15. $\frac{1}{2^x} = \frac{1}{16}$
16. $(\frac{1}{3})^{3-3x} = \frac{1}{27}$
17. $\frac{1}{e^{x+1}} = e^2$
18. $\frac{2^3}{2^{x-1}} = 2$
19. $\frac{e^{2x}}{e^{x+1}} = e$
20. $5^x = 2$
21. $5 + 4^x = 12$
22. $2 \cdot 2^x = 18$
23. $4 - 6^x = -2$
24. $4 - 7 \cdot 3^x = -31$
25. $10 = 1 + 3 \cdot e^x$
26. $34 = 16 + 2 \cdot 3^x$
27. $9^{x+4} = 27^{5x-3}$
28. $3(2 + e^{x/4}) = 27$
29. $2^{x+2} = 3$
30. $7 - 2e^{7x+5} = 3$
31. $4^{4x-3} - 1 = 15$
32. $(\frac{1}{7})^x = 49^{x+6}$
33. $16^{2-3x} = 32^{5x+1}$
34. $3 - \frac{9^{x+2}}{9^7} = 2$
35. $5 - (3 + e^{x/2}) = -1$
36. $3 = 2 + \frac{4^{x+1}}{4^2}$
37. $5 = -1 + 2(1 + e^{x/3})$
38. $\log_2 x = 3$
39. $\log_3 x = 2$
40. $\log_5(2x + 3) = 1$
41. $\log_2(2^x) = 971$
42. $5 \log_{10}(x + 2) = 15$
43. $\frac{1}{6} \log_5 x = \frac{1}{2}$
44. $\log_{10}(x + 2) = \log_{10}(2x - 4)$
45. $\ln(11x) = \ln(3 - x)$
46. $\log_2(x^2) = \log_2(16)$

Simplify:

47. $\log_4 4$
48. $\log_5 25$
49. $\log_2(\frac{1}{4})$
50. $\log_7(\frac{1}{7})$
51. $\log_{219}(1)$
52. $2 \log_2(16)$
53. $5 \log_3(\frac{1}{3})$
54. $-4 \log_{10}(\frac{1}{1000})$
55. $217 \log_{568}(1)$

Answers:

1. 2
2. 3
3. 1
4. 0
5. -1
6. $\frac{1}{2}$
7. 2
8. $\frac{1}{2}$
9. 5
10. -2
11. 2
12. -1
13. -1
14. -2
15. 4
16. 0
17. -3
18. 3
19. 2
20. $\log_5 2$
21. $\log_4 7$
22. $\log_2 9$
23. 1
24. $\log_3 5$
25. $\ln 3$
26. 2
27. $\frac{17}{13}$
28. $4 \ln 7$
29. $-2 + \log_2 3$
30. $\frac{\ln 2 - 5}{7}$
31. $\frac{5}{4}$
32. -4
33. $\frac{3}{37}$
34. 5
35. $2 \ln 3$
36. 1
37. $3 \ln 2$
38. 8
39. 9
40. 1
41. 971
42. 998
43. 125
44. 6
45. $\frac{1}{4}$
46. ± 4
47. 1
48. 2
49. -2
50. -1
51. 0
52. 8
53. -5
54. 12
55. 0