

4.6 Practice Set

Identify each equation as linear, absolute value linear, quadratic, polynomial, rational, radical, exponential, logarithmic, or substitution (quadratic in disguise). Then solve each equation for the indicated variable and identify any extraneous solutions. In the cases when solutions involve logarithms, give both the exact solution and an approximation rounded to four decimal places.

1. $2(x - 3) + 5 = 3x + 1$

2. $|7x - 1| + 9 = 15$

3. $x^2 = 32$

4. $6x^2 - 5x = 4$

5. $3x^3 + 9x^2 - 5x = 15$

6. $\frac{5}{2z^2+z-3} - \frac{2}{2z+3} = \frac{z+1}{z-1} - 1$

7. $\sqrt{3y+1} + 1 = y$

8. $\sqrt{x+5} + \sqrt{x-3} = 4$

9. $x^{\frac{3}{2}} = 8$

10. $2x^{\frac{2}{3}} - 2 = 3x^{\frac{1}{3}}$

11. $15(2t+9)^2 + 14(2t+9) - 8 = 0$

12. $2x^4 - 26x^2 + 24 = 0$

13. $25^x = 125$

14. $3^{2x-1} = 4$

15. $7^{x^2+3x} = \frac{1}{49}$

16. $2^{5x} = 7^{x-3}$

17. $e^{4x-5} = 15$
18. $\log_2(x - 3) = -1$
19. $2\log_3 x - \log_3(x - 4) - \log_3 2 = 2$
20. $\log x = 2 - \log(x - 15)$
21. $\sqrt[4]{2x - 5} + 1 = 0$
22. $\frac{x}{2x+1} - \frac{2}{x-3} = \frac{x^2+5}{2x^2-5x-3}$
23. $12 - 15x = 7x - 10x^2$
24. $3 + (5 - x)^{\frac{1}{2}} = x$
25. $(\ln x)^2 - 7\ln x + 12 = 0$
26. $x^{-2} - x^{-1} = 5$
27. $5x^4 - 10x^3 + 3x^2 - 6x = 0$
28. $e^{\frac{2x}{3}} - e^{\frac{x}{3}} = 6$
29. $(\log x)^2 - 7\log x = -6$
30. $\log_5(4 - y) + \log_5(4 + y) = \log_5 8$