

$$\begin{aligned} (x-1)^{\frac{1}{2}} &= 0 \quad \text{or} \quad x-2=0 \\ \frac{1}{(x-1)^{\frac{1}{2}}} &= 0 \quad \quad \quad x=2 \end{aligned}$$

The original equation has only one solution: $x = 2$

1.5 EXERCISES

PRACTICE

Solve the following quadratic-like equations. See Example 1.

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| 1. $(x-1)^2 + (x-1) - 12 = 0$ | 2. $(z-8)^2 - 7(z-8) + 12 = 0$ |
| 3. $(y-5)^2 - 11(y-5) + 24 = 0$ | 4. $(x^2-1)^2 + (x^2-1) - 12 = 0$ |
| 5. $(x^2+1)^2 + (x^2+1) - 12 = 0$ | 6. $(x^2-13)^2 + (x^2-13) - 12 = 0$ |
| 7. $(x^2-2x+1)^2 + (x^2-2x+1) - 12 = 0$ | 8. $2y^{\frac{2}{3}} + y^{\frac{1}{3}} - 1 = 0$ |
| 9. $2x^{\frac{2}{3}} - 7x^{\frac{1}{3}} + 3 = 0$ | 10. $(x^2-6x)^2 + 4(x^2-6x) - 5 = 0$ |
| 11. $(y^2-5)^2 + 5(y^2-5) - 36 = 0$ | 12. $(x^2+7)^2 + 8(x^2+7) + 12 = 0$ |
| 13. $(t^2-t)^2 - 8(t^2-t) + 12 = 0$ | 14. $2x^{\frac{1}{2}} - 5x^{\frac{1}{4}} + 2 = 0$ |
| 15. $3x^{\frac{2}{3}} - x^{\frac{1}{3}} - 2 = 0$ | 16. $y^{\frac{1}{2}} - 5y^{\frac{1}{4}} + 6 = 0$ |
| 17. $(z^2+4z)^2 + 7(z^2+4z) + 12 = 0$ | 18. $5y^{\frac{2}{3}} + 33y^{\frac{1}{3}} + 18 = 0$ |

Solve the following polynomial equations by factoring. See Example 2.

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|------------------------------|-------------------------------|--------------------------|
| 19. $a^3 - 3a^2 = a - 3$ | 20. $2x^3 + x^2 + 2x + 1 = 0$ | 21. $2x^3 - x^2 = 15x$ |
| 22. $x^4 + 5x^2 - 36 = 0$ | 23. $y^4 + 21y^2 - 100 = 0$ | 24. $y^3 + 8 = 0$ |
| 25. $5s^3 + 6s^2 - 20s = 24$ | 26. $8a^3 - 27 = 0$ | 27. $16a^4 = 81$ |
| 28. $6x^3 + 8x^2 = 14x$ | 29. $14x^3 + 27x^2 - 20x = 0$ | 30. $5z^3 + 28z^2 = 49z$ |
| 31. $27x^3 + 64 = 0$ | 32. $x^3 - 4x^2 + x = 4$ | 33. $x^3 + 27 = 0$ |

Solve the following equations by factoring. See Example 3.

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| 34. $3x^{\frac{11}{3}} + 2x^{\frac{8}{3}} - 5x^{\frac{5}{3}} = 0$ | 35. $(x-3)^{\frac{-1}{2}} + 2(x-3)^{\frac{1}{2}} = 0$ |
| 36. $(y-6)^{\frac{-5}{2}} + 7(y-6)^{\frac{-3}{2}} = 0$ | 37. $y^{-2} - 2y^{-1} + 1 = 0$ |

38. $2x^{\frac{13}{5}} - 5x^{\frac{8}{5}} + 2x^{\frac{3}{5}} = 0$

40. $x^{-4} - 13x^{-2} + 36 = 0$

42. $(t+4)^{\frac{2}{3}} + 2(t+4)^{\frac{8}{3}} = 0$

44. $x^{\frac{11}{2}} - 6x^{\frac{9}{2}} + 9x^{\frac{7}{2}} = 0$

46. $5y^{\frac{12}{5}} - 43y^{\frac{7}{5}} + 24y^{\frac{2}{5}} = 0$

48. $x^{-2} + 8x^{-1} + 15 = 0$

39. $(2x-5)^{\frac{1}{3}} - 3(2x-5)^{\frac{-2}{3}} = 0$

41. $y^{\frac{7}{2}} - 5y^{\frac{5}{2}} + 6y^{\frac{3}{2}} = 0$

43. $y^{-2} - 2y^{-1} - 35 = 0$

45. $5y^{\frac{11}{3}} + 3y^{\frac{8}{3}} - 2y^{\frac{5}{3}} = 0$

47. $(3x-3)^{\frac{-1}{3}} - 5(3x-3)^{\frac{-4}{3}} = 0$

49. $(y+3)^{\frac{2}{5}} + 4(y+3)^{\frac{7}{5}} = 0$



WRITING & THINKING

50. Find b , c , and d so the equation $x^3 + bx^2 + cx + d = 0$ has solutions of -3 , -1 , and 5 .
51. Find b , c , and d so the equation $x^3 + bx^2 + cx + d = 0$ has solutions of -2 , 0 , and 6 .
52. Find b and c so the equation $x^3 + bx^2 + cx = 0$ has solutions of 0 , 1 , and -7 .
53. Find a , c , and d so the equation $ax^3 + 4x^2 + cx + d = 0$ has solutions of -4 , 6 , and -6 .
54. Find a , b , and d so the equation $ax^3 + bx^2 + 3x + d = 0$ has solutions of -3 , $-\frac{1}{2}$, and 0 .
55. Find a , b , and c so the equation $ax^3 + bx^2 + cx + 6 = 0$ has solutions of $-\frac{3}{5}$, $\frac{2}{3}$, and 1 .