

2.10 Practice Set

1. When is substitution a helpful tool for solving equations?
2. Describe the method of substitution for solving an equation.

Solve each of the following equations for the indicated variable.

Write answers as complex numbers $\mathbf{a} + \mathbf{bi}$ when they are complex.

Simplify your answers and rationalize denominators in your answers when necessary.

3. $(3x - 1)^2 - 5(3x - 1) + 4 = 0$

4. $s^{\frac{2}{3}} + 2s^{\frac{1}{3}} = 3$

5. $15(r + 5)^2 = 8(r + 5) - 1$

6. $m^{-2} + m^{-1} = 12$

7. $x^4 + 9x^2 + 8 = 0$

8. $10(x + 4)^{-2} - 7(x + 4)^{-1} + 1 = 0$

9. $3y^4 - 18y^2 + 15 = 0$

10. $(2z + 9)^2 + 3(2z + 9) - 8 = 0$

11. $(4x - 3)^{\frac{2}{3}} + 11(4x - 3)^{\frac{1}{3}} + 18 = 0$

12. $2(5y - 3)^{-2} - 7(5y - 3)^{-1} + 3 = 0$

13. $(3t - 2)^4 = 2(3t - 2)^2 - 1$

14. $5(2x + 1)^{\frac{2}{3}} + 21(2x + 1)^{\frac{1}{3}} = 20$

15. $\frac{1}{3}r^{-2} + \frac{2}{3}r^{-1} = 1$

16. $y - 6y^{\frac{1}{2}} + 9 = 0$

$$17. \quad \left(\frac{1}{x+3}\right)^2 + \frac{3}{x+3} = 4$$

$$18. \quad 5(2n + 3) + 23\sqrt{2n + 3} = 10$$

$$19. \quad r^6 - 7r^3 + 6 = 0$$

$$20. \quad y^{\frac{6}{5}} - 2y^{\frac{3}{5}} + 1 = 0$$

Distributed Practice Problems

Solve each of the following equations for the indicated variable. Simplify all answers completely.

$$21. \quad (x - 2)^2 + 20 = 0$$

$$22. \quad 5y^3 + 5y - 10y^2 = 10$$

$$23. \quad 7s^4 = 56s$$

$$24. \quad 9r^2 - 15r = -12$$

$$25. \quad t(6t - 3) = 5$$