

4.1 Practice Set

Solve each of the following equations for the indicated variable.

Write answers as complex numbers ***a + bi*** when they are complex.

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

1. $3x = \sqrt{15x - 4}$

2. $y - 5\sqrt{y} = 6$

3. $\frac{3}{t} = 1 - \frac{3}{t-2}$

4. $m^{-2} + 7m^{-1} = -12$

5. $x^4 - 13x^2 + 42 = 0$

6. $\frac{2a}{a-1} - \frac{2}{a^2-4a+3} = \frac{a}{a-3}$

7. $6y^4 - 19y^2 + 15 = 0$

8. $3(2r - 1)^2 + 4(2r - 1) + 1 = 0$

9. $(4z + 5)^{\frac{2}{3}} + 10(4z + 5)^{\frac{1}{3}} + 21 = 0$

10. $x^3 + 9x - 4x^2 - 36 = 0$

11. $\frac{m}{m-2} + \frac{1}{m+2} = \frac{8}{m^2-4}$

12. $r - 5 = \sqrt{43 - 3r}$

13. $\frac{1}{5}(x + 3)^{-2} + \frac{4}{5}(x + 3)^{-1} = 1$

14. $z - 7z^{\frac{1}{2}} = 0$

15. $5^x = 4$

16. $2^{3x-1} = 4$

17. $3^{4x} = 5^{7x+9}$
18. $\log_2(y - 12) = 5$
19. $\log_3(z + 2) + \log_3 z = 1$
20. $\log_5(4x + 5) - \log_5(x - 5) = 2$
21. $e^{5m} = 10$
22. $7t^3 + 35t - 2t^2 = 10$
23. $9r^5 = 36r^2$
24. $-5|2x - 3| + 9 = -1$
25. $y(2y - 1) = 3$

Distributed Practice Problems

Simplify each of the following expressions completely.

26. $\frac{3-6i}{2+5i}$
27. $\frac{8\sqrt{2}-3\sqrt{5}}{\sqrt{5}+2\sqrt{2}}$
28. $(25x^6y^{-3})^{\frac{1}{2}}(32x^{-10}y^{\frac{1}{2}})^{-\frac{2}{5}}$
29. $2\log_3(x - 1) + \frac{1}{2}\log_3 x - \log_3(x^2 - 1)$
30. $e^{2\ln x}$