

Simplify the following exercises.

1. $\sqrt{64}$

2. $-\sqrt{81}$

3. $\sqrt{-9}$

4. $\sqrt{36} + \sqrt{225}$

5. $\sqrt{36 + 225}$

6. $\sqrt{49y^2}$

7. $-\sqrt{100b^4}$

8. $\sqrt{121b^4d^6}$

9. $\sqrt{4x^{12}z^8}$

Use the Product Property to Simplify Square Roots

10. $\sqrt{300}$

11. $\sqrt{98}$

12. $\sqrt{d^{19}}$

13. $\sqrt{36n^{13}}$

14. $\sqrt{288m^{21}}$

15. $\sqrt{108r^5t^3}$

16. $\sqrt{150x^4y^{11}}$

17. $\frac{10-\sqrt{50}}{5}$

18. $\frac{6+\sqrt{72}}{6}$

Use the Quotient Property to Simplify Square Roots

19. $\sqrt{\frac{16}{25}}$

20. $\sqrt{\frac{x^8}{x^4}}$

21. $\sqrt{\frac{72x^8}{2x^2}}$

22. $\sqrt{\frac{36r^{10}}{16r^5}}$

23. $\sqrt{\frac{48a^3b^5}{27ab}}$

24. $\sqrt{\frac{12r^5t^7}{75r^2t}}$

Perform the indicated operation. When possible simplify your answer.

25. $\sqrt{32} + 3\sqrt{2}$

26. $\sqrt{72} - \sqrt{50}$

27. $\sqrt{48} + \sqrt{75}$

28. $3\sqrt{32} - \sqrt{98}$

29. $\frac{1}{3}\sqrt{27} - \frac{1}{8}\sqrt{192}$

30. $\sqrt{50y^5} - \sqrt{72y^5}$

31. $\sqrt{2} \cdot \sqrt{20}$

32. $(6\sqrt{2y})(3\sqrt{50y^4})$

33. $(-\sqrt{10})^2$

34. $(5 - 3\sqrt{7})(1 - 2\sqrt{7})$

35. $\sqrt{3}(4 + \sqrt{12})$

36. $(2 - 6\sqrt{5})^2$

37. $(6 - \sqrt{11})(6 + \sqrt{11})$

38. $(1 + 2\sqrt{6})^2$

39. $(3 + 2\sqrt{7})(3 - 2\sqrt{7})$

Divide Square Roots. Simplify your answer.

$$40. \frac{\sqrt{75}}{10}$$

$$41. \frac{\sqrt{20y^5}}{\sqrt{2y}}$$

$$42. \frac{\sqrt{98p^6q^4}}{\sqrt{2p^4q^8}}$$

Rationalize the Denominator. Simplify your answer

$$43. \frac{10}{\sqrt{15}}$$

$$44. \frac{5}{3\sqrt{5}}$$

$$45. \frac{10}{2\sqrt{6}}$$

$$46. \frac{5}{2-\sqrt{10}}$$

$$47. \frac{5}{4-\sqrt{8}}$$

$$48. \frac{4}{2+\sqrt{5}}$$

Solve the following equations. Make sure to check your solutions.

$$49. \sqrt{6m+4} - 5 = 0$$

$$50. \sqrt{u-4} + 4 = u$$

$$51. \sqrt{2-x} = \sqrt{2x-7}$$

$$52. 2\sqrt{2x-7} - 4 = 8$$

53. $\sqrt{u} + 2 = \sqrt{u + 5}$

54. $\sqrt{y + 5} + 1 = \sqrt{2y + 3}$

55. Officer Morales measured the skid marks of one of the cars involved in an accident. The length of the skid marks was 245 feet. Use the formula $s = \sqrt{24d}$ to find the speed of the car before the brakes were applied.

Simplify

56. $\sqrt[3]{-27}$

57. $\sqrt[4]{16x^8}$

58. $\sqrt[4]{81t^{24}}$

59. $\sqrt[3]{-54}$

60. $\sqrt[4]{48d^7}$

61. $\sqrt[3]{343z^7}$

62. $\sqrt[5]{\frac{r^{10}}{r^5}}$

63. $\sqrt[6]{\frac{64a^7}{b^6}}$

64. $\sqrt[5]{n^8}$

Write the following as rational exponents

65. $\sqrt[6]{n}$

66. $\sqrt[8]{c}$

67. $\sqrt[3]{9m}$

68. $\sqrt[5]{x^3}$

69. $\sqrt[4]{p^7}$

70. $\sqrt[8]{x^{12}}$

Simplify

71. $32^{\frac{1}{5}}$

72. $(-125)^{\frac{1}{3}}$

73. $(36)^{-\frac{1}{2}}$

74. $27^{-\frac{2}{3}}$

75. $64^{\frac{5}{2}}$

76. $16^{\frac{5}{4}}$

77. $3^{\frac{4}{5}} \cdot 3^{\frac{6}{5}}$

78. $(x^6)^{\frac{4}{3}}$

79. $\frac{z^{\frac{5}{2}}}{z^{\frac{7}{5}}}$