

Evaluate (if possible) and simplify the following. Assume nonnegative variables. Rationalize any denominators.

1. $\sqrt{3^4}$

2. $\sqrt{\frac{4}{9}}$

3. $\sqrt{(-3)^2}$

4. $\sqrt{-16}$

5. $\sqrt[3]{216}$

6. $-\sqrt[5]{-32}$

7. $\sqrt{32}$

8. $\sqrt{64 + 36}$

9. $\sqrt{\frac{49}{18}}$

10. $\sqrt{49z^6}$

11. $\sqrt{12x^5}$

12. $\sqrt[3]{24x^5y^4}$

13. $\sqrt{20a^3b^4c^6}$

14. $\sqrt{5x} \cdot \sqrt{20x^3}$

15. $\sqrt{\frac{24x^6}{6y^4}}$

16. $\frac{\sqrt{20x^4y^9z^2}}{\sqrt{5x^3yz^3}}$

17. $(\sqrt{z^6})^3$

18. $\sqrt[3]{4a^3b^8} \cdot \sqrt[3]{12a^{10}b^7}$

1. 9

2. $\frac{2}{3}$

3. 3

4. Not Real

5. 6

6. 2

7. $4\sqrt{2}$

8. 10

9. $\frac{7\sqrt{2}}{6}$

10. $7z^3$

11. $2x^2\sqrt{3x}$

12. $2xy\sqrt[3]{3x^2y}$

13. $2ab^2c^3\sqrt{5a}$

14. $10x^2$

15. $\frac{2\sqrt{2}x^3}{y^2}$

16. $\frac{2y^4}{z}\sqrt{xz}$

17. z^9

18. $2a^4b^5\sqrt[3]{6a}$