

Radicals

Simplify.

1. $\sqrt{49x^8}$

2. $\sqrt[3]{27x^9}$

3. $\sqrt{27x^3y^4}$

4. $\sqrt[3]{16x^4y^3z^6}$

5. $\sqrt[4]{32x^5y^{10}}$

6. $\sqrt{\frac{32}{36}}$

7. $\sqrt[3]{\frac{8x^5y^6}{27}}$

8. $\frac{\sqrt[3]{24x^3y^5}}{\sqrt[3]{3y^2}}$

9. $\sqrt{12x^3} \cdot \sqrt{6x^5}$

10. $\sqrt{\frac{6x}{5}} \cdot \sqrt{\frac{10x^7}{y^3}}$

Add or subtract.

11. $3\sqrt{5} + 8\sqrt{5}$

12. $\sqrt[3]{16} - 2\sqrt[3]{54}$

13. $-5\sqrt{45} + 6\sqrt{20} + 3\sqrt{5}$

14. $x\sqrt{20} - 3\sqrt{125x^2}$

15. $2x\sqrt[3]{40xy} - 3\sqrt[3]{5x^4y}$

Multiply:

16. $(-4\sqrt{5}) \cdot (2\sqrt{10})$

17. $(8\sqrt{5x^4y})(2\sqrt{3xy^3})$

18. $\sqrt{5}(\sqrt{10} + 2)$

19. $(2\sqrt{3} + \sqrt{6})(\sqrt{3} - \sqrt{6})$

20. $(3 - \sqrt{x})(2 - \sqrt{x})$

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

Answers: 1. $7x^4$

2. $3x^3$

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

4. $2xyz^2\sqrt[3]{2x}$

5. $2xy^2\sqrt[4]{2xy^2}$

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

7. $\frac{2xy^2\sqrt[3]{x^2}}{3}$

8. $2xy$

9. $6x^4\sqrt{2}$

10. $\frac{2x^4\sqrt{2}}{y\sqrt{y}}$

11. $11\sqrt{5}$

12. $-4\sqrt[3]{2}$

13. 0

14. $-13x\sqrt{5}$

15. $x\sqrt[3]{5xy}$

16. $-40\sqrt{2}$

17. $16x^2y^2\sqrt{15x}$

18. $5\sqrt{2} + 2\sqrt{5}$

19. $-3\sqrt{2}$

20. $6 - 5\sqrt{x} + x$

21. 4