

Simplifying Radicals

$$1. \sqrt{2} \cdot \sqrt{3} = \sqrt{2 \cdot 3} = \sqrt{6}$$

$$2. \sqrt{4} \cdot \sqrt{6} = 2\sqrt{2 \cdot 3} = 2\sqrt{6}$$

$$3. \sqrt{x} \cdot \sqrt{y} = \sqrt{xy}$$

$$4. \sqrt[3]{5} \cdot \sqrt[3]{6} = \sqrt[3]{5 \cdot 6} = \sqrt[3]{30}$$

$$5. \sqrt[3]{12} \cdot \sqrt[3]{4} = 2\sqrt[3]{2 \cdot 3}$$

$$6. \sqrt[3]{x^2} \cdot \sqrt[3]{x^5} = x^2\sqrt[3]{x}$$

$$7. \sqrt[4]{4} \cdot \sqrt[4]{32} = 2\sqrt[4]{2^3}$$

$$8. \sqrt[4]{x^3} \cdot \sqrt[4]{x^5} = x^2$$

$$9. \sqrt[5]{x^7} \cdot \sqrt[5]{x^2} = x\sqrt[5]{x^4}$$

$$10. \sqrt[5]{8x^3} \cdot \sqrt[5]{4x^4} = 2x\sqrt[5]{x^2}$$

$$11. \sqrt[6]{24x^4} \cdot \sqrt[6]{243x^3} = 3x\sqrt[6]{2^2x}$$

$$12. \sqrt[10]{128x^7} \cdot \sqrt[10]{512x^5} = 2x\sqrt[10]{2^6x^2}$$

$$13. \sqrt{2} \cdot \sqrt[3]{4} = 2\sqrt[6]{2}$$

$$14. \sqrt{x} \cdot \sqrt[4]{x^2} = x$$

$$15. \sqrt{x^2y} \cdot \sqrt[3]{x^5y^4} = x^2y\sqrt[6]{x^4y^5}$$

$$16. \sqrt[3]{x^2y} \cdot \sqrt[4]{x^5y^7} = xy^2\sqrt[12]{x^{11}y}$$

$$17. \sqrt[4]{8x^4y^2} \cdot \sqrt[3]{16x^6y^4} = 2^2x^3y^2\sqrt[12]{2}$$

$$18. \sqrt{25xy^3} \cdot \sqrt[3]{625x^7y^5} = 5^2x^2y^3\sqrt[6]{5^2x^5y}$$

$$19. \sqrt{5xy} \cdot \sqrt[3]{625x^4y^5} \cdot \sqrt[4]{3125x^2y^7} = 5^3x^2y^3\sqrt[12]{5xy^8}$$

$$20. \sqrt{32x^5y^3} \cdot \sqrt[4]{8x^4y^6} \cdot \sqrt[3]{64x^7y^8} = 2^5x^5y^5\sqrt[12]{2^3x^{10}y^8}$$

$$21. \frac{\sqrt{6}}{\sqrt{2}} = \sqrt{3}$$

$$22. \frac{\sqrt{6x^3y}}{\sqrt{3xy}} = x\sqrt{2}$$

$$23. \frac{\sqrt[3]{16x^4}}{\sqrt[3]{2x}} = 2x$$

$$24. \frac{\sqrt[3]{5x^2y^5}}{\sqrt[3]{625x^5y^2}} = \frac{y}{5x}$$

$$25. \frac{\sqrt[4]{64x^7y^4z^{11}}}{\sqrt[4]{4x^{11}y^8z^3}} = \frac{2z^2}{xy}$$

$$26. \frac{\sqrt[5]{x^4y^9z^{12}}}{\sqrt[5]{x^9y^4z^2}} = \frac{yz^2}{x}$$

$$27. \frac{\sqrt{3}}{\sqrt[3]{3}} = \sqrt[6]{3}$$

$$28. \frac{\sqrt[4]{6}}{\sqrt{6}} = \frac{\sqrt[4]{2^33^3}}{2 \cdot 3}$$

$$29. \frac{\sqrt[3]{x^2}}{\sqrt[4]{x^5}} = \frac{\sqrt[12]{x^5}}{x}$$

$$30. \frac{\sqrt{xy}}{\sqrt[5]{x^2y^4}} = \frac{\sqrt[10]{xy^7}}{y}$$

$$31. \frac{\sqrt[3]{x^2 y z^4}}{\sqrt[4]{x^3 y^6 z^3}} = \frac{\sqrt[12]{x^{11} y^{10} z^7}}{xy^2}$$

$$33. \frac{\sqrt[5]{x^4 y^{11} z^3}}{\sqrt[3]{x^6 y^2 z^8}} = \frac{y \sqrt[15]{x^{12} y^8 z^{14}}}{x^2 z^3}$$

$$35. \frac{\sqrt[3]{(x^4 y^2 z)^2}}{\sqrt{(xy^4 z^5)^3}} = \frac{x^6 \sqrt[6]{xy^2 z}}{y^5 z^7}$$

$$36. \frac{\sqrt{(x^4 y^5 z^{-3})^4}}{\sqrt[3]{(x^{-2} y^7 z^4)^2}} = \frac{x^9 y^2 \sqrt[6]{x^2 z^2}}{z^9}$$

$$37. \frac{\sqrt[4]{(x^{-3} y^2 z^{-5})^{-2}}}{\sqrt[3]{(x^{-4} y^9 z^{-3})^2}} = \frac{x^4 \sqrt[12]{x^2 y^6 z^6}}{y^8 z}$$

$$38. \frac{\sqrt{4x^2 y} \cdot \sqrt[3]{16x^4 y^2}}{\sqrt[4]{8x^3 y^5}} = \frac{2x \sqrt[12]{2^7 x^7 y^{11}}}{y}$$

$$39. \frac{\sqrt[3]{27x^{-6} y^7} \cdot \sqrt{243x^2 y^{-5}}}{\sqrt[4]{81x^9 y^{-6}}} = \frac{y \sqrt[12]{3^{10} x^9 y^4}}{x^4}$$

$$40. \frac{\sqrt{12x^5 y^3} \cdot \sqrt[5]{48x^3 y^7}}{\sqrt[3]{8x^4 y^2} \cdot \sqrt[4]{81x^5 y^6}} = \frac{y^2 \sqrt[60]{2^{48} 3^{42} x^{31} y^{14}}}{3}$$

$$41. (\sqrt{2} + \sqrt[3]{3})(\sqrt{2} + 2\sqrt[3]{3}) = 2 + 3\sqrt[6]{2^3 3^2} + 2\sqrt[3]{3^2}$$

$$42. (\sqrt[3]{5} + \sqrt[4]{7})(\sqrt[3]{5} + \sqrt[4]{7}) = \sqrt[3]{5^2} + 2\sqrt[12]{5^4 7^3} + \sqrt[4]{7^2}$$