

SHOW ALL WORK!

In problems 1-7, simplify completely

$$1. \sqrt{36x^4y^{16}} = 6x^2y^8$$

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

$$5. \sqrt[3]{243a^{25}b^5} = 3a^5b$$

$$\begin{array}{c} \wedge \\ 3 \quad 81 \\ \wedge \quad \wedge \\ 9 \quad 9 \\ \wedge \quad \wedge \\ 3 \quad 3 \quad 3 \end{array}$$

$$7. \underline{6\sqrt{2}} + 5\sqrt{3} - \underline{2\sqrt{2}} = 4\sqrt{2} + 5\sqrt{3}$$

$$9. \sqrt[4]{x} = \sqrt[2]{\sqrt{x}}$$

$$2. 2x\sqrt[3]{64x^{10}y^8} = 6x^4y^2\sqrt[3]{xy^2}$$

$$\begin{array}{c} \wedge \quad \wedge \\ 8 \quad 8 \\ \wedge \quad \wedge \\ 4 \quad 2 \quad 4 \\ \wedge \quad \wedge \\ 2 \quad 2 \quad 2 \end{array}$$

$$4. \sqrt{3y}\sqrt{27xy} = \sqrt{81xy^2} = 9y\sqrt{x}$$

$$\begin{array}{c} \wedge \\ 3 \quad 27 \\ \wedge \\ 3 \quad 9 \\ \wedge \\ 3 \quad 3 \end{array}$$

$$6. \sqrt[3]{2x^5y^2}\sqrt[3]{20xy^5} = \sqrt[3]{40x^6y^7} = 2x^2y^2\sqrt[3]{5y}$$

$$\begin{array}{c} \wedge \\ 2 \quad 20 \\ \wedge \quad \wedge \\ 2 \quad 10 \\ \wedge \\ 2 \quad 5 \end{array}$$

$$8. \sqrt{18} - \sqrt{50} + \sqrt[3]{54} = \underline{3\sqrt{2}} - \underline{5\sqrt{2}} + 3\sqrt[3]{2}$$

$$= -2\sqrt{2} + 3\sqrt[3]{2}$$

$$\begin{array}{c} \wedge \quad \wedge \quad \wedge \\ 2 \quad 9 \quad 2 \quad 25 \quad 3 \quad 18 \\ \wedge \quad \wedge \quad \wedge \\ 3 \quad 3 \quad 5 \quad 5 \quad 2 \quad 9 \\ \wedge \quad \wedge \\ 3 \quad 3 \end{array}$$

$$10. \sqrt[3]{5x} = \sqrt[15]{x}$$

In problems 11-15, rationalize the denominator and simplify completely.

$$11. \frac{\sqrt{3m}\sqrt{7}}{\sqrt{63m}} = \frac{\sqrt{21m}}{3\sqrt{7m}} \cdot \frac{\sqrt{7m}}{\sqrt{7m}} = \frac{\sqrt{147m^2}}{3 \cdot 7m} = \frac{7m\sqrt{3}}{21m} = \frac{\sqrt{3}}{3}$$

$$12. \frac{1x}{\sqrt[3]{6x}} \cdot \frac{\sqrt[3]{6^2x^2}}{\sqrt[3]{6^2x^2}} = \frac{x \sqrt[3]{36x^2}}{6x} = \frac{\sqrt[3]{36x^2}}{6}$$

$$13. \frac{12}{\sqrt{10}+2} \cdot \frac{\sqrt{10}-2}{\sqrt{10}-2} = \frac{12\sqrt{10}-24}{10-2\sqrt{10}+2\sqrt{10}-4} = \frac{12\sqrt{10}-24}{6} = 2\sqrt{10}-4$$

$$14. \frac{3\sqrt{x}}{3-4\sqrt{x}} \cdot \frac{3+4\sqrt{x}}{3+4\sqrt{x}} = \frac{9\sqrt{x}+12x}{9+12\sqrt{x}-12\sqrt{x}-16x} = \frac{9\sqrt{x}+12x}{9-16x}$$

$$15. \frac{\sqrt{10}-\sqrt{6}}{\sqrt{10}+\sqrt{6}} \cdot \frac{\sqrt{10}-\sqrt{6}}{\sqrt{10}-\sqrt{6}} = \frac{10-\sqrt{60}-\sqrt{60}+6}{10-\sqrt{60}+\sqrt{60}-6} = \frac{16-2\sqrt{60}}{4} = \frac{16-4\sqrt{15}}{4} = 4-\sqrt{15}$$

$$\begin{array}{c} 60 \\ \wedge \\ 6 \quad 10 \\ \wedge \quad \wedge \\ 2 \quad 3 \quad 2 \quad 5 \end{array}$$