

7.2 Properties of Radicals

Simplify each radical expression.

$$\begin{array}{c} \sqrt{48} \\ \sqrt{16 \cdot 3} \\ \boxed{4\sqrt{3}} \end{array}$$

$$\begin{array}{c} \sqrt[3]{40} \\ \wedge \\ 8 \cdot 5 \\ \boxed{2\sqrt[3]{5}} \end{array}$$

$$\begin{array}{c} \sqrt[3]{72} \\ \wedge \\ 8 \cdot 9 \\ \boxed{2\sqrt[3]{9}} \end{array}$$

Multiplication: insides w/ insides, outsides w/ outsides

1.) $2\sqrt{5} \cdot 3\sqrt{8}$

2.) $\sqrt[3]{3} \cdot \sqrt[3]{9}$

3.) $\sqrt[4]{6} \cdot \sqrt[4]{8}$

multiply \rightarrow $6\sqrt{40}$
 \wedge
 4 10
 simplify \rightarrow $6 \cdot 2\sqrt{10}$
 $\boxed{12\sqrt{10}}$

$$\begin{array}{c} \sqrt[3]{27} \\ \boxed{3} \end{array}$$

$$\begin{array}{c} \sqrt[4]{48} \\ \wedge \\ 16 \cdot 3 \\ \boxed{2\sqrt[4]{3}} \end{array}$$

Division:

4.) $\frac{10\sqrt{12}}{5\sqrt{3}}$

5.) $\frac{6\sqrt[3]{16}}{4\sqrt[3]{2}}$

6.) $\frac{\sqrt[4]{48}}{\sqrt[4]{3}}$

$$\begin{array}{c} 2\sqrt{4} \\ 2 \cdot 2 \\ \boxed{4} \end{array}$$

$$\begin{array}{c} \frac{3}{2}\sqrt[3]{8} \\ \frac{3}{2}(2) \\ \boxed{3} \end{array}$$

$$\begin{array}{c} \sqrt[4]{16} \\ \boxed{2} \end{array}$$

Checkpoint:

7.) $\sqrt[3]{2} \cdot \sqrt[3]{4}$

8.) $2\sqrt[5]{4} \cdot 3\sqrt[5]{8}$

9.) $\frac{\sqrt[3]{54}}{\sqrt[3]{2}}$

10.) $\frac{15\sqrt[3]{81}}{5\sqrt[3]{3}}$

$$\begin{array}{c} \sqrt[3]{8} \\ \boxed{2} \end{array}$$

$$\begin{array}{c} 6\sqrt[5]{32} \\ 6 \cdot 2 \\ \boxed{12} \end{array}$$

$$\begin{array}{c} \sqrt[3]{27} \\ \boxed{3} \end{array}$$

$$\begin{array}{c} 3\sqrt[3]{27} \\ 3 \cdot 3 \\ \boxed{9} \end{array}$$

① Simplify each radical

Adding and Subtracting: ② Combine "like" radicals

11.) $4\sqrt[3]{3} + 2\sqrt[3]{3}$

$$\boxed{6\sqrt[3]{3}}$$

12.) $7\sqrt[5]{12} - \sqrt[5]{12}$

$$\boxed{6\sqrt[5]{12}}$$

Simplify first!

13.) $\sqrt[4]{12} + \sqrt[4]{27}$

$$2\sqrt[4]{3} + 3\sqrt[4]{3}$$

$$\boxed{5\sqrt[4]{3}}$$

14.) $\sqrt[4]{32} - \sqrt[4]{162}$

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

$$\boxed{-1\sqrt[4]{2}}$$

15.) $\sqrt{25} + \sqrt{100}$

$$5 + 10$$

$$\boxed{15}$$

Checkpoint:

16.) $5\sqrt[4]{7} - 8\sqrt[4]{7}$

$$\boxed{-3\sqrt[4]{7}}$$

17.) $5\sqrt[7]{x} + 3\sqrt[7]{x}$

$$\boxed{8\sqrt[7]{x}}$$

18.) $\sqrt[3]{27} + \sqrt[3]{8}$

$$3 + 2$$

$$\boxed{5}$$