

Radicals

Simplify radicals

• $\sqrt{8}$

$$\begin{array}{r} 2 \overline{) 8} \\ 4 \\ \hline 2 \end{array}$$

$$2\sqrt{2}$$

$\sqrt{50}$

$$\begin{array}{r} 2 \overline{) 50} \\ 25 \\ \hline 5 \end{array}$$

$$5\sqrt{2}$$

$\sqrt[3]{16}$

$$\begin{array}{r} 2 \overline{) 16} \\ 8 \\ \hline 8 \\ 2 \end{array}$$

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

ADD and subtract

• $3\sqrt[3]{2} + 6\sqrt[3]{2} = 9\sqrt[3]{2}$

• $5\sqrt{3} + \sqrt{3} = 6\sqrt{3}$

• $2\sqrt{5} + 4\sqrt{5} + \sqrt{5} = 7\sqrt{5}$

• $6\sqrt[3]{7} + 8\sqrt[3]{7} = 14\sqrt[3]{7}$

• $2\sqrt[3]{4} + 3\sqrt[3]{4} = 5\sqrt[3]{4}$

subtracting

• $7\sqrt[3]{3} - 5\sqrt[3]{3} = 2\sqrt[3]{3}$

• $15\sqrt{6} - \sqrt{6} = 14\sqrt{6}$

• $10\sqrt{7} - 2\sqrt{7} - 4\sqrt{7} = 4\sqrt{7}$

• $6\sqrt[3]{5} - 5\sqrt[3]{5} = \sqrt[3]{5}$

• $9\sqrt[3]{4} - 5\sqrt[3]{4} = 4\sqrt[3]{4}$

Radicals with exponents

• $4\sqrt{5^3} = 5\frac{3}{4}$

• $\sqrt[3]{4^2} = 4\frac{2}{3}$

• $\sqrt{7} = 7\frac{1}{2}$

• $\sqrt{x} = x\frac{1}{2}$

• $\sqrt[3]{x} = x\frac{1}{3}$

• $5\frac{2}{3} = \sqrt[3]{5^2}$

• $4\frac{3}{2} = \sqrt[3]{4^3}$

multiplying

• $2\sqrt[3]{7} \times 8\sqrt[3]{3} = 16\sqrt[3]{21}$

• $3\sqrt{2} \times 6\sqrt{8} = 18\sqrt{16}$
 $= 18\sqrt{2 \times 2 \times 2 \times 2}$
 $= 18 \times 2 \times 2$
 $= 72$

variables

• $10\sqrt{x} \times 3\sqrt[3]{y} = 30\sqrt[3]{xy}$

Dividing

• $24\sqrt[3]{14} \div 6\sqrt[3]{2} = 4\sqrt[3]{7}$

• $12\sqrt{21} \div 4\sqrt{3} = 3\sqrt{7}$
 $= 3\sqrt{3 \times 3}$
 $= 3 \times 3$
 $= 9$

• $80\sqrt{3} \div 10\sqrt{2} = \frac{8\sqrt{3}}{\sqrt{2}}$
 $= \frac{8\sqrt{3}}{2} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{8\sqrt{6}}{2} = 4\sqrt{6}$