

Simplifying Radicals

Simplify.

1) $\sqrt{80}$

2) $\sqrt{245}$

3) $\sqrt{200}$

4) $\sqrt{384}$

5) $\sqrt{1000}$

6) $\sqrt{128}$

7) $2\sqrt{3} - \sqrt{3}$

8) $3\sqrt{20} - 2\sqrt{5}$

9) $-2\sqrt{2} - 2\sqrt{8}$

10) $-2\sqrt{27} - 3\sqrt{3}$

11) $2\sqrt{5} + 2\sqrt{5}$

12) $2\sqrt{2} + 3\sqrt{8}$

Simplifying Radicals

Simplify.

$$1) \sqrt{80} = \sqrt{5} \cdot \sqrt{16}$$

$$\begin{array}{l} 1 \cdot 80 \\ 2 \cdot 40 \\ 4 \cdot 20 \\ 5 \cdot 16 \\ 8 \cdot 10 \end{array} \quad \begin{array}{l} \sqrt{5} \cdot 4 \\ \boxed{4\sqrt{5}} \end{array}$$

$$2) \sqrt{245} = \sqrt{5} \cdot \sqrt{49}$$

$$\begin{array}{l} 1 \cdot 245 \\ 5 \cdot 49 \\ 7 \cdot 35 \end{array} \quad \begin{array}{l} \sqrt{5} \cdot 7 \\ \boxed{7\sqrt{5}} \end{array}$$

$$3) \sqrt{200} = \sqrt{2} \cdot \sqrt{100}$$

$$\begin{array}{l} 1 \cdot 200 \\ 2 \cdot 100 \\ 4 \cdot 50 \\ 5 \cdot 40 \\ 8 \cdot 25 \end{array} \quad \begin{array}{l} \sqrt{2} \cdot 10 \\ 10 \cdot 20 \\ \boxed{10\sqrt{2}} \end{array}$$

$$4) \sqrt{384} = \sqrt{6} \cdot \sqrt{64}$$

$$\begin{array}{l} 2 \cdot 192 \\ 3 \cdot 128 \\ 4 \cdot 96 \\ 6 \cdot 64 \end{array} \quad \begin{array}{l} \sqrt{6} \cdot 8 \\ \boxed{8\sqrt{6}} \end{array}$$

$$5) \sqrt{1000} = \sqrt{10} \cdot \sqrt{100}$$

$$\begin{array}{l} 10 \cdot 100 \end{array} \quad \begin{array}{l} \sqrt{10} \cdot 10 \\ \boxed{10\sqrt{10}} \end{array}$$

$$6) \sqrt{128} = \sqrt{2} \cdot \sqrt{64}$$

$$\begin{array}{l} 2 \cdot 64 \end{array} \quad \begin{array}{l} \sqrt{2} \cdot 8 \\ \boxed{8\sqrt{2}} \end{array}$$

$$7) 2\sqrt{3} - \sqrt{3} = \boxed{\sqrt{3}}$$

$$8) 3\sqrt{20} - 2\sqrt{5}$$

$$3 \cdot \sqrt{4} \sqrt{5} - 2\sqrt{5}$$

$$3 \cdot 2 \cdot \sqrt{5} - 2\sqrt{5}$$

$$6\sqrt{5} - 2\sqrt{5} = \boxed{4\sqrt{5}}$$

$$9) -2\sqrt{2} - 2\sqrt{8}$$

$$-2\sqrt{2} - 2\sqrt{4} \sqrt{2}$$

$$-2\sqrt{2} - 2 \cdot 2\sqrt{2}$$

$$-2\sqrt{2} - 4\sqrt{2} = \boxed{-6\sqrt{2}}$$

$$10) -2\sqrt{27} - 3\sqrt{3}$$

$$-2\sqrt{9} \sqrt{3} - 3\sqrt{3}$$

$$-2 \cdot 3\sqrt{3} - 3\sqrt{3}$$

$$-6\sqrt{3} - 3\sqrt{3} = \boxed{-9\sqrt{3}}$$

$$11) 2\sqrt{5} + 2\sqrt{5}$$

$$\boxed{4\sqrt{5}}$$

$$12) 2\sqrt{2} + 3\sqrt{8}$$

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

$$2\sqrt{2} + 3 \cdot 2 \cdot \sqrt{2}$$

$$2\sqrt{2} + 6\sqrt{2}$$

$$\boxed{8\sqrt{2}}$$