

Multiplying Square Roots

- 1) Simplify square roots
- 2) Multiply all numbers outside radical
- 3) Multiply all numbers left under the radical
- 4) Simplify answer if possible

$$\sqrt{3}\sqrt{6} = \sqrt{18} = \boxed{3\sqrt{2}}$$

$$\begin{array}{r} 18 \\ \sqrt{2} \overline{) 18} \\ \underline{6} \\ 12 \\ \underline{12} \\ 0 \end{array}$$

$$\sqrt{5}\sqrt{10} = \sqrt{50} = \boxed{5\sqrt{2}}$$

$$\sqrt{2 \cdot 5 \cdot 5} = 5\sqrt{2}$$

$$\begin{array}{l} 3\sqrt{8} \cdot 6\sqrt{3} = 18\sqrt{24} \\ 18 \sqrt{2 \cdot 2 \cdot 2 \cdot 3} \\ 18 \cdot 2 \sqrt{2 \cdot 3} \\ \boxed{36\sqrt{6}} \end{array}$$

$$\begin{array}{r} 24 \\ \sqrt{2} \overline{) 24} \\ \underline{4} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

$$2\sqrt{8} \cdot \sqrt{12} = 2\sqrt{96}$$

$$2 \sqrt{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3} \\ 2 \cdot 2 \cdot 2 \sqrt{2 \cdot 3} = 8\sqrt{6}$$

$$\begin{array}{r} 96 \\ \textcircled{2} \overline{) 48} \\ \underline{48} \\ 0 \\ \textcircled{2} \overline{) 24} \\ \underline{24} \\ 0 \\ \textcircled{2} \overline{) 12} \\ \underline{12} \\ 0 \\ \textcircled{3} \overline{) 6} \\ \underline{6} \\ 0 \end{array}$$

OR $4\sqrt{2} \cdot 2\sqrt{3}$
 $8\sqrt{6}$

$$-\sqrt{27} \cdot 3\sqrt{20} = -3\sqrt{3} \cdot 6\sqrt{5} = -18\sqrt{15}$$

$$\begin{array}{r} 6 \\ \textcircled{2} \overline{) 3} \\ \underline{6} \\ 0 \end{array}$$

$$\begin{array}{r} 9 \textcircled{3} \\ \textcircled{3} \overline{) 3} \\ \underline{3} \\ 0 \end{array} \quad \begin{array}{r} 4 \textcircled{2} \\ \textcircled{2} \overline{) 2} \\ \underline{2} \\ 0 \end{array} \quad 3 \sqrt{2 \cdot 2 \cdot 5} = 3 \cdot 2\sqrt{5} \\ \textcircled{3} \overline{) 3} \\ \underline{3} \\ 0 \end{array} \quad \begin{array}{r} 6\sqrt{5} \end{array}$$

$$-2\sqrt{8} \cdot \sqrt{4} \cdot \sqrt{18} =$$

Simplify first: $-4\sqrt{2} \cdot 2 \cdot 2\sqrt{3}$

Mult $-16\sqrt{6}$

Simplify? No - already in simplest form