

UNIT 9 - ADDING AND SUBTRACTING RADICALS

Adding and subtracting radicals rules:

1. simplify each first
2. Combine like terms

Examples:

1) $\sqrt{5} + 3\sqrt{5}$
 $4\sqrt{5}$

2) $6\sqrt{2} - 4\sqrt{2}$
 $2\sqrt{2}$

3) $\sqrt{12} + \sqrt{3}$
 $\sqrt{6 \cdot 2} + \sqrt{3}$
 $\sqrt{2 \cdot 3} + \sqrt{3}$
 $2\sqrt{3} + \sqrt{3}$
 $3\sqrt{3}$

4) $\sqrt{12} - 2\sqrt{27} + \sqrt{32}$
 $\sqrt{6 \cdot 2} - 2\sqrt{9 \cdot 3} + \sqrt{8 \cdot 4}$
 $\sqrt{2 \cdot 3} - 2\sqrt{3 \cdot 3} + \sqrt{2 \cdot 2 \cdot 2 \cdot 2}$
 $2\sqrt{3} - 6\sqrt{3} + 4\sqrt{2}$
 $-4\sqrt{3} + 4\sqrt{2}$

5) $4\sqrt{18} - 2\sqrt{6} + \sqrt{8}$
 $4\sqrt{9 \cdot 2} - 2\sqrt{6} + \sqrt{4 \cdot 2}$
 $12\sqrt{2} - 2\sqrt{6} + 2\sqrt{2}$
 $14\sqrt{2} - 2\sqrt{6}$

7) $2\sqrt{75} - \sqrt{48}$
 $2\sqrt{25 \cdot 3} - \sqrt{16 \cdot 3}$
 $2\sqrt{5 \cdot 5 \cdot 3} - \sqrt{4 \cdot 4 \cdot 3}$
 $10\sqrt{3} - 4\sqrt{3}$
 $6\sqrt{3}$

Try these!

$$1) 2\sqrt{7} + 4\sqrt{7} - 12\sqrt{7}$$
$$6\sqrt{7} - 12\sqrt{7}$$
$$\boxed{-6\sqrt{7}}$$

$$2) 3\sqrt{6} - 2\sqrt{3} - 7\sqrt{3}$$
$$\boxed{3\sqrt{6} - 9\sqrt{3}}$$

$$3) \sqrt{50} + 3\sqrt{18}$$
$$\begin{array}{cc} \textcircled{2} \sqrt{25} & \textcircled{6} \sqrt{3} \\ \textcircled{5} \textcircled{5} & \textcircled{2} \textcircled{3} \end{array}$$
$$5\sqrt{2} + 9\sqrt{2}$$
$$\boxed{14\sqrt{2}}$$

$$4) 3\sqrt{200} - 2\sqrt{98}$$
$$\begin{array}{cc} \textcircled{2} \sqrt{100} & \sqrt{49} \\ \textcircled{10} \textcircled{10} & \textcircled{7} \textcircled{7} \end{array}$$
$$\textcircled{2} \textcircled{5} \textcircled{2} \textcircled{5}$$
$$30\sqrt{2} - 14\sqrt{2}$$
$$\boxed{16\sqrt{2}}$$

