

Adding/Subtracting

1. The number under the radical (radicand) has to be the same
2. If not, simplify
3. Combine like terms by adding/subtracting coefficients + keep the radicand

Ex 4 $3\sqrt{6} + 8\sqrt{6}$
 $\boxed{11\sqrt{6}}$

Ex 5 $2\sqrt{7} + 9\sqrt{3} - 8\sqrt{7}$
 $\boxed{-6\sqrt{7} + 9\sqrt{3}}$

Ex 6 $5\sqrt{3} - \sqrt{27}$
 $5\sqrt{3} - 3\sqrt{3}$
 $2\sqrt{3}$

1. Same
2. outside
3. Simplify

1. $-8\sqrt{3}$ 2. $\sqrt{32} + 2\sqrt{2}$
 2. $6\sqrt{2}$ $\begin{matrix} 16 \\ \sqrt{2} \\ 4\sqrt{2} + 2\sqrt{2} \\ 6\sqrt{2} \end{matrix}$
 3. $10\sqrt{3}$ $\begin{matrix} 4 & 4 \\ \sqrt{3} & \sqrt{3} \\ 4\sqrt{3} + 4\sqrt{3} \\ 8\sqrt{3} \end{matrix}$
 3. $3\sqrt{12} + 4\sqrt{3}$
 $6\sqrt{3} + 4\sqrt{3} = 10\sqrt{3}$

4. $8\sqrt{10}$ 5. $-2\sqrt{3}$ 6. $\sqrt{2a}$

7. $4\sqrt{x} + \sqrt{2}$ 8. $4\sqrt{7} + 3\sqrt{3}$

9. $3\sqrt{6} + 6\sqrt{2}$ 10. $3\sqrt{2}$

11. $2\sqrt{5}$ 12. $5\sqrt{2}$

10. $7\sqrt{18} + 2\sqrt{50}$
 $\begin{matrix} 9 \\ \sqrt{2} \\ 3\sqrt{2} \end{matrix}$ $\begin{matrix} 25 \\ \sqrt{2} \\ 5\sqrt{2} \end{matrix}$
 $21\sqrt{2} + 10\sqrt{2}$
 $31\sqrt{2}$

11. $8\sqrt{5} - 2\sqrt{45}$
 $\begin{matrix} 9 \\ \sqrt{5} \\ 3\sqrt{5} \end{matrix}$
 $8\sqrt{5} - 6\sqrt{5}$
 $2\sqrt{5}$

6. $\sqrt{8a} - \sqrt{2a}$
 $\begin{matrix} 4 \\ \sqrt{2} \\ 2\sqrt{2} \end{matrix}$ $\sqrt{2a}$
 $2\sqrt{2a} - \sqrt{2a}$
 $\sqrt{2a}$

7. $\sqrt{7x} + \sqrt{2} + 3\sqrt{7x}$

$4\sqrt{7x} + \sqrt{2}$

9. $\sqrt{2} - 4\sqrt{6} + 5\sqrt{2} + \sqrt{6}$
 $-3\sqrt{6} + 6\sqrt{2}$

1. Multiply the radicands together
2. Multiply the coefficients together
3. Simplify

Ex 7 $\sqrt{5} \cdot \sqrt{20}$

$$\sqrt{100}$$

$$10$$

Ex 8 $7\sqrt{8} \cdot 7\sqrt{8}$

$$7\sqrt{64}$$

$$7 \cdot 8$$

$$56$$

Ex 9 $7\sqrt{2} \cdot 3\sqrt{18}$

$$21\sqrt{36}$$

$$21 \cdot 6$$

$$126$$

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

$$15\sqrt{8}$$

$$4^2$$

$$\textcircled{22}$$

$$30\sqrt{2}$$

4.) $7\sqrt{2} (4 - \sqrt{3})$

$$\boxed{28\sqrt{2} - 7\sqrt{6}}$$

- | | |
|-----------------|-----------------------------|
| 1. $3\sqrt{10}$ | 4. $28\sqrt{2} - 7\sqrt{6}$ |
| 2. $12\sqrt{2}$ | 5. 6 |
| 3. $30\sqrt{2}$ | 6. $\sqrt{10} + \sqrt{5}$ |