

**Summary**

**Simplest Radical Form**

A radical expression is in simplest radical form when all three statements are true.

- The radicand has no perfect-square factors other than 1.
- The radicand has no fractions.
- The denominator of a fraction has no radical.

**Simplify Square Roots**

1. $\sqrt{125n}$	2. $\sqrt{512k^2}$	3. $\sqrt{216k^4}$	4. $\sqrt{80p^3}$
5. $\sqrt{147m^3n^2}$	6. $-4\sqrt{192x}$	7. $3\sqrt{16x^4y^4z}$	8. $6\sqrt{75mp^2q^5}$

**Property**

**Multiplication Property of Square Roots**

For every number  $a \geq 0$  and  $b \geq 0$ ,  $\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}$ .

**Example**  $\sqrt{54} = \sqrt{9} \cdot \sqrt{6} = 3 \cdot \sqrt{6} = 3\sqrt{6}$

**Multiplying Radicals**

1. $\sqrt{5} \cdot \sqrt{10}$	2. $\sqrt{5} \cdot -4\sqrt{20}$	3. $\sqrt{20} \cdot \sqrt{20x^2}$	4. $-4\sqrt{28x} \cdot \sqrt{7x^3}$
5. $5\sqrt{42x}(4 + 4\sqrt{7x})$	6. $\sqrt{21r}(5 + \sqrt{7})$		

**Vocabulary****Like Radicals**

**Like radicals** have the same radicand. **Unlike radicals** do not have the same radicand. For example,  $4\sqrt{7}$  and  $-12\sqrt{7}$  are like radicals, but  $3\sqrt{11}$  and  $2\sqrt{5}$  are unlike radicals. To simplify sums and differences, you use the Distributive Property to combine like radicals.

**Adding & Subtracting Radicals**

1. $3\sqrt{6} - 4\sqrt{6}$	2. $-3\sqrt{7} + 4\sqrt{7}$	3. $-3\sqrt{17} - 4\sqrt{17}$	4. $-2\sqrt{3} + 3\sqrt{27}$
5. $2\sqrt{6} + 3\sqrt{54}$	6. $-3\sqrt{20} - \sqrt{5}$	7. $3\sqrt{18} - 2\sqrt{2}$	
8. $-2\sqrt{20} + 2\sqrt{18} - 2\sqrt{5}$	9. $-3\sqrt{45} + 2\sqrt{12} + 3\sqrt{6} - 3\sqrt{20}$	10. $-\sqrt{27} - 3\sqrt{45} - \sqrt{20} + 2\sqrt{45}$	

**Property****Division Property of Square Roots**

For every number  $a \geq 0$  and  $b > 0$ ,  $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$ .

**Example**  $\sqrt{\frac{16}{25}} = \frac{\sqrt{16}}{\sqrt{25}} = \frac{4}{5}$

**Dividing Radicals**

1. $\frac{\sqrt{8}}{\sqrt{100}}$	2. $\frac{3\sqrt{20}}{2\sqrt{4}}$
3. $\frac{\sqrt{2}}{2\sqrt{3}}$	4. $\frac{\sqrt{15xy}}{3\sqrt{10xy^3}}$