

## 7-1 Simplifying Square Roots

Perfect Squares

1, 4, 9, 16, 25, 36, 49, 64, 81, 100 ...

Square roots of perfect squares

$\sqrt{1} = 1$     $\sqrt{4} = 2$     $\sqrt{9} = \underline{3}$     $\sqrt{16} = 4$     $\sqrt{25} = 5$     $\sqrt{36} = \underline{6}$  ...

Simplifying the square roots which are NOT perfect squares

Ex. 1       $\sqrt{40}$

$$\begin{array}{c} \sqrt{4 \cdot 10} \\ \boxed{2\sqrt{10}} \end{array}$$

Ex. 2

$$\begin{array}{c} \sqrt{45} \\ \sqrt{9 \cdot 5} \\ \boxed{3\sqrt{5}} \end{array}$$

Find each positive root in the simplest form

Ex. 3  $\sqrt{x^2} = \sqrt{12}$

$$x = \pm \sqrt{12}$$

$$= \pm \sqrt{3 \cdot 4} \quad 2\sqrt{3}$$

Ex. 4  $\sqrt{x^2} = \sqrt{50}$

$$x = \pm \sqrt{50}$$

$$= \pm \sqrt{2 \cdot 25} = \pm 5\sqrt{2}$$

Find each value in simplest form

Ex. 5  $(2\sqrt{3})^2$

$$4 \cdot 3 = \boxed{12}$$

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

$$4 \cdot 3 = \boxed{12}$$

Ex. 6  $(3\sqrt{5})^2$

$$9 \cdot 5 = \boxed{45}$$

$$(3\sqrt{5})^2$$

Rationalize each denominator, then simplify

$$\text{Ex. 7} \quad \frac{6\sqrt{3}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{6\sqrt{6}}{2} = 3\sqrt{6}$$

$$\text{Ex. 8} \quad \frac{4}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{4\sqrt{3}}{3}$$