## **Simplest Radical Form**

## Algebra

When a problem involves square roots, you may be asked to give the answer in simplest radical form. Recall that the radicand is the expression under the radical sign.



On Track for

## Simplest Form of a Square-Root Expression

An expression containing square roots is in simplest form when

- the radicand has no perfect square factors other than 1.
- the radicand has no fractions.
- there are no square roots in any denominator.

To simplify a radical expression, remember that the square root of a product is equal to the product of the square roots. Also, the square root of a quotient is equal to the quotient of the square roots.

$$\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}$$
, when  $a \ge 0$  and  $b \ge 0$ 

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$
, when  $a \ge 0$  and  $b > 0$ 

## Examples

Write each expression in simplest radical form.

 $\begin{array}{c} \mathbf{B} \quad \frac{6}{\sqrt{2}} \\ \frac{6}{\sqrt{2}} \end{array}$  $\bigwedge$   $\sqrt{216}$ There is a square root in  $\sqrt{216}$ 216 has a perfect-square factor the denominator, so the of 36, so the expression is not expression is not in simplest in simplest radical form. radical form. Multiply by a form of 1 to  $\sqrt{(36)(6)}$ Factor the radicand.  $\frac{6}{\sqrt{2}}\left(\frac{\sqrt{2}}{\sqrt{2}}\right)$ eliminate the square root in the denominator.  $\sqrt{36} \cdot \sqrt{6}$ Product Property of Square Roots Simplify.  $\frac{6\sqrt{2}}{2}$  $6\sqrt{6}$ Simplify.  $3\sqrt{2}$ Divide.



Write each expression in simplest radical form.

**1.**  $\sqrt{720}$  **2.**  $\sqrt{\frac{3}{16}}$  **3.**  $\frac{10}{\sqrt{2}}$ 

**4.**  $\sqrt{\frac{1}{3}}$ 

