

Objective: TSWBAT simplify radicals involving products and quotients

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

- The expression under the radical sign has no perfect square factors other than 1

- The expression under the radical sign does not contain a fraction

- The denominator does not contain a radical expression

Property**Multiplication Property of Square Roots**

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

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

1 EXAMPLE Removing Perfect-Square Factors

Simplify $\sqrt{192}$.

$$\sqrt{192} = \sqrt{64 \cdot 3}$$

$$= \sqrt{64} \cdot \sqrt{3}$$

$$= 8\sqrt{3}$$

64 is a perfect square and a factor of 192.

Use the Multiplication Property of Square Roots.

Simplify $\sqrt{64}$.

1 Simplify each radical expression.

Simplify $\sqrt{243}$.

c. $\sqrt{18}$

Simplify $\sqrt{28x^7}$.

a. $\sqrt{12} \cdot \sqrt{32}$

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

$$\textcircled{a} \sqrt{\frac{11}{49}}$$

$$\textcircled{b} \sqrt{\frac{25}{b^4}}$$

$$\textcircled{c} \frac{\sqrt{96}}{\sqrt{12}}$$

$$\textcircled{d} \sqrt{\frac{144}{9}}$$

$$\textcircled{e} \frac{\sqrt{24}}{\sqrt{8}}$$

$$\textcircled{f} \sqrt{\frac{25c^2}{b^2}}$$

$$\textcircled{g} \frac{2}{\sqrt{5}}$$

$$\textcircled{h} \frac{3}{\sqrt{3}}$$

$$\textcircled{i} \frac{14}{\sqrt{7}}$$

$$\textcircled{j} \frac{9}{\sqrt{10}}$$

$$\textcircled{k} \sqrt{200}$$

$$\textcircled{l} \sqrt{16a^5b^3}$$

$$\textcircled{m} \sqrt{12} \cdot \sqrt{10}$$

$$\textcircled{n} \sqrt{5x} \cdot \sqrt{4x}$$

$$\textcircled{o} 5\sqrt{3} \cdot 2\sqrt{6}$$