

Example 4 Simplify the radical expression

$$\sqrt{\frac{12}{7}} \cdot \frac{3\sqrt{15}}{2\sqrt{7}}$$

Simplifying Square Roots



To simplify means...

It does not mean...

[A] $\sqrt{12}$

[B] $\sqrt{2}$

[C] $4 + \sqrt{8}$

[D] $3 + \sqrt{12}$

Sometimes it is easier to simplify the radicals separately and other times it is easier to combine first. Each problem needs a different approach.

Example 3 How do you divide with radicals?

$$\frac{\sqrt{a}}{\sqrt{a}} = \sqrt{\frac{b}{a}}$$

Quotient Property

[A] $\sqrt[9]{25}$

[B] $\sqrt[18]{2}$

[C] $\sqrt[2]{4}$

[D] $\sqrt[36]{12}$

[A] $3\sqrt{2}\sqrt{10}$

[B] $\sqrt{5}\sqrt{60}$

[C] $\sqrt{6}(4\sqrt{24})$

[D] $3\sqrt{75}\sqrt{6}$

Step 1: Multiply the radicands to combine the radicals

[A] $3\sqrt{2}\sqrt{10}$

[B] $\sqrt{5}\sqrt{60}$

[C] $\sqrt{6}(4\sqrt{24})$

[D] $3\sqrt{75}\sqrt{6}$

Product Property $\sqrt{a}\sqrt{b} = \sqrt{ab}$
Step 2: Simplify

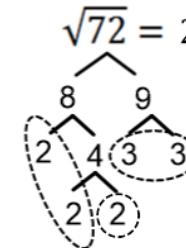
Example 2 How do you multiply radicals?

Example 1 How do you simplify radicals?

Step 1: Make a factor tree

Step 2: Since the index of a square root is two, group common factors in pairs

Step 3: Each group means one of that factor comes out, the rest stay under



$$\sqrt{72} = 2 \cdot 3\sqrt{2} = 6\sqrt{2}$$

$\sqrt{72}$	8.485281374
$6\sqrt{2}$	8.485281374

[A] $\sqrt{56}$

[B] $\sqrt{225}$

[C] $\sqrt{504}$