

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...

Example 3 How do you divide with radicals?

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

$$\text{Quotient Property} \quad \frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$$

[D] $\frac{3 + \sqrt{12}}{\sqrt{36}}$

[C] $\frac{4 + \sqrt{8}}{2}$

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

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

Example 2 How do you multiply radicals?

Step 1: Multiply the radicands to combine the radicals
Step 2: Simplify

$$\text{Product Property} \quad \sqrt{a}\sqrt{b} = \sqrt{ab}$$

[A] $3\sqrt{2}\sqrt{10}$
[B] $\sqrt{5}\sqrt{60}$
[C] $\sqrt{6}(4\sqrt{24})$
[D] $3\sqrt{75}\sqrt{6}$

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] $\sqrt{504}$