Warm Up

Simplify each of the following expressions.

1. $\sqrt{3} \cdot \sqrt{3} = \sqrt{9} = 3$

2. $2\sqrt{5} \cdot \sqrt{5} = 2\sqrt{25} = 2 \cdot 5 = 10$

3. $3\sqrt{2} \cdot \sqrt{8} = 3\sqrt{16} = 3 \cdot 4 = 12$

4. $\frac{35 \div 5}{80 \div 5} = \frac{7}{16}$

Rationalizing Denominators

Clear Learning Target

You will be able to use the quotient property of square roots to simplify radical expressions.

Words Worth Knowing!

Quotient Proprety of Square Roots -

If a and b are #'s

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

Rationalizing the Denominator - a method used to eliminate radicals from the denominator of a fraction

Example #1

$$\sqrt{\frac{7}{3}} = \frac{\sqrt{7}}{\sqrt{3}}$$

$$\frac{\sqrt{7}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \boxed{\frac{\sqrt{21}}{3}}$$

RATIONALIZING!

Example #2:

$$\sqrt{\frac{15}{33}} \overset{\div 3}{\underset{\div 3}{=}} \sqrt{\frac{5}{11}}$$

$$\frac{\sqrt{5}}{\sqrt{11}} \cdot \frac{\sqrt{11}}{\sqrt{11}} = \boxed{\frac{\sqrt{55}}{11}}$$

55
5 11

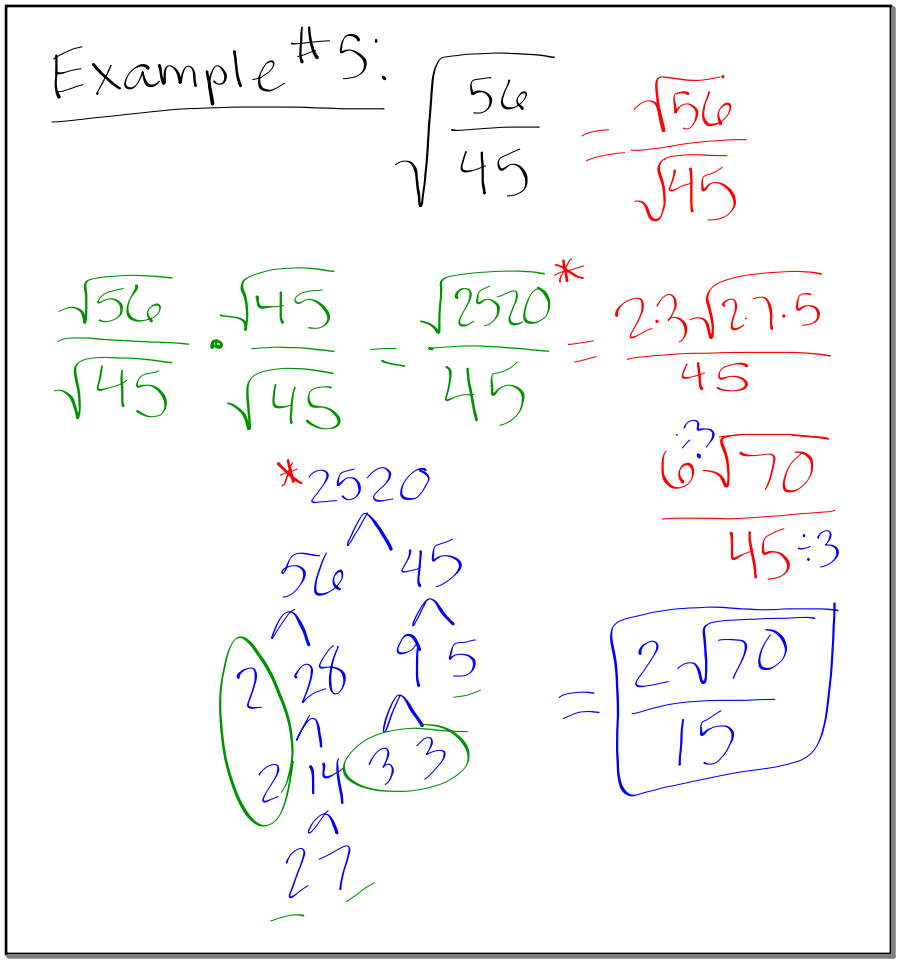
EXAMPLE #3: $\sqrt{\frac{45 \div 5}{10 \div 5}} = \sqrt{\frac{9}{2}}$

$\frac{\sqrt{9}}{\sqrt{2}} = \frac{3}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \boxed{\frac{3\sqrt{2}}{2}}$

EXAMPLE #4: $\sqrt{\frac{x^5}{y}} = \frac{\sqrt{x^5}}{\sqrt{y}}$

$\frac{\sqrt{x^5}}{\sqrt{y}} \cdot \frac{\sqrt{y}}{\sqrt{y}} = \frac{\sqrt{x^5 y}}{y}$ * $= \boxed{\frac{x^2\sqrt{xy}}{y}}$

* $x \cdot x \cdot x \cdot x \cdot x \cdot y$ $= x^2 \sqrt{xy}$


Example #5:
$\sqrt{\frac{56}{45}} = \frac{\sqrt{56}}{\sqrt{45}}$
$\frac{\sqrt{56}}{\sqrt{45}} \cdot \frac{\sqrt{45}}{\sqrt{45}} = \frac{\sqrt{2520}}{45} = \frac{2\cdot3\sqrt{2\cdot7\cdot5}}{45}$
$\frac{6\sqrt{70}}{45\div3}$
*2520
56 45
2 28 9 5
2 14 3 3
2 7
$= \frac{2\sqrt{70}}{15}$