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11-8 rationalizing the denominator.....#

**Objectives**

Multiply and divide radical expressions.  
Rationalize denominators.



Mar 11-2:01 PM

Review from yesterday:  
(left page)

$$\frac{\sqrt{8} \cdot \sqrt{6}}{\sqrt{48}} = \frac{\sqrt{10} \cdot 3}{4\sqrt{3}} = \frac{3\sqrt{10}}{4\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{3\sqrt{30}}{4 \cdot 3} = \frac{\sqrt{30}}{4}$$

$$(2\sqrt{5})^2 = 2\sqrt{5} \cdot 2\sqrt{5} = 4\sqrt{25} = 4 \cdot 5 = 20$$

$$\sqrt{3}(7 - \sqrt{8}) \quad (3 - \sqrt{8})(2 + \sqrt{8})$$

Mar 15-7:53 AM

**Rationalize denominators**

A quotient with a square root in the denominator is not simplified. To simplify these expressions, multiply by a form of 1 to get a perfect-square radicand in the denominator. This is called **rationalizing the denominator**.

**Simplify the quotient.**

$$\frac{\sqrt{11} \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}\sqrt{9}} = \frac{\sqrt{33}}{3}$$

Multiply by a form of 1 to get a perfect-square radicand in the denominator.

$$\frac{\sqrt{11}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{33}}{3}$$

Product Property of Square Roots.

$$\frac{\sqrt{33}}{\sqrt{9}} = \frac{\sqrt{33}}{3}$$

Simplify the denominator.

Mar 15-8:04 AM

Simplify the quotient: **ALWAYS LOOK TO REDUCE FIRST!!!**

When do you need to rationalize the denominator?

$$\frac{5\sqrt{7}}{\sqrt{7} \cdot \sqrt{7}} = \frac{5\sqrt{7}}{7} \quad \frac{\sqrt{3} \cdot \sqrt{5}}{\sqrt{5} \cdot \sqrt{5}} = \frac{\sqrt{15}}{5}$$

$$\frac{2\sqrt{3} \cdot \sqrt{7}}{\sqrt{7} \cdot \sqrt{7}} = \frac{2\sqrt{21}}{7}$$

$$\frac{\sqrt{7x}}{\sqrt{43}} \cdot \frac{\sqrt{3}}{2\sqrt{3} \cdot \sqrt{3}} = \frac{\sqrt{21x}}{6}$$

$$\frac{\sqrt{3m}}{\sqrt{20}} = \frac{\sqrt{3m} \cdot \sqrt{5}}{2\sqrt{5} \cdot \sqrt{5}} = \frac{\sqrt{15m}}{10}$$

left page:

$$\frac{\sqrt{3m}}{\sqrt{2}}$$

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Simplify the quotient: **ALWAYS LOOK TO REDUCE FIRST!!!**

$$\frac{\sqrt{5} \cdot \sqrt{x}}{\sqrt{x} \cdot \sqrt{x}} = \frac{\sqrt{5x}}{x}$$

$$\frac{\sqrt{3x}}{\sqrt{18}} = \frac{\sqrt{3x}}{\sqrt{9 \cdot 2}} = \frac{\sqrt{3x}}{3\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{6x}}{6}$$

$$\frac{20}{\sqrt{40}} = \frac{10 \cdot \sqrt{10}}{\sqrt{10} \cdot \sqrt{10}} = \frac{10\sqrt{10}}{10} = \sqrt{10}$$

$$6\sqrt{\frac{33x^2}{300x}}$$

Mar 15-8:26 AM

Simplify the quotient: **ALWAYS LOOK TO REDUCE FIRST!!!**

$$\frac{3\sqrt{5x}}{\sqrt{50}}$$

left page:

$$\frac{\sqrt{49}}{14\sqrt{2}} \quad \frac{\sqrt{5}}{2\sqrt{10}}$$

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Homework:

Pg 819 #19-26, <sup>40-52</sup>45-52, ~~75-77~~  
All evens

20.  $\frac{\sqrt{20} \div 4}{\sqrt{8} \div 4} = \frac{\sqrt{5} \cdot \sqrt{2}}{\sqrt{2} \cdot \sqrt{2}} = \frac{\sqrt{10}}{2}$

Mar 15-8:41 AM