

# Dividing Radicals Day 4 NOTES

Note Title

16/11/2017

I.  $\frac{\sqrt{m}}{\sqrt{n}}$  is equivalent to  $\sqrt{\frac{m}{n}}$

e.g.  $\frac{\sqrt{18}}{\sqrt{6}} = \sqrt{3}$

or  $\sqrt{\frac{18}{6}} = \sqrt{3}$

If you can divide easily **DO IT!**

$$\frac{2\sqrt{36}}{\sqrt{12}} \rightarrow 2\sqrt{3}$$

$$\frac{5\sqrt{18}}{\sqrt{2}} \rightarrow 5\sqrt{\frac{18}{2}} = 5\sqrt{9} = 15$$

## II. Rationalizing the denominator

Radicals are irrational numbers. We prefer to not have them in the denominator.

e.g.  $\frac{3}{\sqrt{2}}$  ← UGLY

rationalize the denominator "make it rational"

$$\frac{3}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{3\sqrt{2}}{\sqrt{4}} = \frac{3\sqrt{2}}{2} \leftarrow \text{PRETTY}$$

rationalize the denominator in these:

a)  $\frac{3\sqrt{5}}{2\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

b)  $\frac{6\sqrt{2}}{\sqrt{12}}$

$$\frac{3\sqrt{15}}{2 \cdot 6}$$

$$\frac{\sqrt{15}}{2}$$

$$\frac{3 \cdot 6\sqrt{2}}{1 \cdot 2\sqrt{3}}$$

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

$$\frac{18\sqrt{6}}{3}$$

$$\sqrt{6}$$

$$\frac{(3\sqrt{10} - \sqrt{2}) \cdot \sqrt{2}}{\sqrt{2} \cdot \sqrt{2}} \rightarrow \frac{3\sqrt{20} - 2}{2}$$

$$\frac{6\sqrt{5} - 2}{2} \rightarrow \frac{2(3\sqrt{5} - 1)}{2}$$

$$3\sqrt{5} - 1$$

III Using the CONJUGATE to rationalize denominator  
 "opposite"

$$\text{UGLY} \rightarrow \frac{\sqrt{7}}{\sqrt{15} - \sqrt{10}} \quad \frac{\sqrt{15} + \sqrt{10}}{\sqrt{15} + \sqrt{10}} \quad \left| \begin{array}{l} a^2 - b^2 \text{ difference} \\ (a-b)(a+b) \text{ of squares} \\ \uparrow \uparrow \\ \text{conjugates} \end{array} \right.$$

TRY THIS:

$$\frac{\sqrt{7}(\sqrt{15} + \sqrt{10})}{15 - 10}$$

$$\frac{5\sqrt{3} - 3\sqrt{5}(\sqrt{5} + \sqrt{3})}{\sqrt{5} - \sqrt{3}(\sqrt{5} + \sqrt{3})}$$

$$\frac{\sqrt{105} + \sqrt{70}}{5}$$

$$\frac{5\sqrt{15} + 5\sqrt{9} - 3\sqrt{25} - 3\sqrt{15}}{5 - 3}$$

$$\frac{2\sqrt{15}}{2} \rightarrow \sqrt{15}$$

FRIDAY:

① Quiz

② Work block to finish Day 4 questions

Simplify radical (+ & -) radicals } Day 1-3  
 multiply radicals

LET'S QUESTIONS

$$\#7 \quad \frac{5\sqrt{2}}{\sqrt{3}} - \frac{3}{\sqrt{6}}$$

$$\frac{5\sqrt{2} \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} - \frac{3 \cdot \sqrt{6}}{\sqrt{6} \cdot \sqrt{6}}$$

$$\frac{5\sqrt{6}}{3} - \frac{3\sqrt{6}}{6}$$

$$\frac{10\sqrt{6} - 3\sqrt{6}}{6}$$

$$\frac{7\sqrt{6}}{6}$$