

# Simplifying Radicals

## In This Unit:

1. Simple Radicands
2. Rationalize the Denominator

**No Bellwork**  
**02/23/2012**

## Lesson 8.1 Simple Radicands

### What You Need to Know:

A radical is a square root symbol  $\sqrt{\quad}$

A radicand is the number under the radical.

Product Property:  $\sqrt{ab} = \sqrt{a} * \sqrt{b}$

Quotient Property:  $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$

To simplify a radical, you **MUST** know at least the first 15 perfect squares.

Perfect Squares:		
$1^2=1$	$6^2=36$	$11^2=121$
$2^2=4$	$7^2=49$	$12^2=144$
$3^2=9$	$8^2=64$	$13^2=169$
$4^2=16$	$9^2=81$	$14^2=196$
$5^2=25$	$10^2=100$	$15^2=225$

To Simplify a Numerical Radicand:

1. Simplify if possible (fractions)
2. Find the greatest perfect square factor
3. Rewrite the radicand as the product of the factors
4. Find the square root and rewrite the answer

**Simple Radicals**

Simplify the radical expression in radical form (no decimal answers).

$$\sqrt{48}$$

$$\sqrt{75}$$

$$\sqrt{125}$$

$$\sqrt{\frac{7}{16}}$$

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

$$\sqrt{\frac{80}{45}}$$

$$\sqrt{\frac{40}{90}}$$

# Homework Assignment

## Worksheet "Simplifying Numerical Radicals"

## Bellwork

02/27/2012

Simplify the radical.

1.  $\sqrt{90}$

$$\begin{aligned} &\sqrt{9 \cdot 10} \\ &\sqrt{9} \cdot \sqrt{10} \\ &3\sqrt{10} \end{aligned}$$

$$\begin{array}{r} 90 \\ \hline 1 \ 90 \\ 2 \ 45 \\ 3 \ 30 \\ 5 \ 18 \\ 6 \ 15 \\ \hline 9 \ 10 \end{array}$$

2.  $\frac{\sqrt{48}}{\sqrt{49}}$

$$\frac{\sqrt{48}}{7}$$

$$\frac{\sqrt{16 \cdot 3}}{7}$$

$$\frac{\sqrt{16} \cdot \sqrt{3}}{7}$$

$$\frac{4\sqrt{3}}{7}$$

$$\begin{array}{r} 48 \\ \hline 1 \ 48 \\ 2 \ 24 \\ \hline 3 \ 16 \\ 4 \ 12 \\ 6 \ 8 \end{array}$$

## Lesson 8.2

### Rationalize the Denominator

#### What You Need to Know:

Sometimes there are square roots in the denominator we just can't get rid of!

**Identity Property:**  $\sqrt{a} * \sqrt{a} = a$

**Multiply the denominator by itself and it gets rid of the square root!**

**If you multiply the bottom by a number, you have to multiply the .... TOP!**

#### To Rationalize the Denominator:

1. Simplify if possible (fraction)
2. Separate using quotient property
3. Multiply both top and bottom by the square root in the denominator
4. Simplify if possible

## Rationalize the denominator

Simplify the radical expression in radical form (no decimal answers). Rationalize the denominator if necessary.

$$\sqrt{\frac{4}{7}}$$

$$\frac{\sqrt{4}}{\sqrt{7}}$$

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

$$\begin{array}{r} 10 \\ \underline{110} \\ 2 \end{array} \begin{array}{l} 10 \\ 5 \end{array}$$

$$\sqrt{\frac{12}{30}} = \sqrt{\frac{2}{5}} = \frac{\sqrt{2} \cdot \sqrt{5}}{\sqrt{5} \cdot \sqrt{5}} = \frac{\sqrt{10}}{5}$$

$$\frac{1}{2} \sqrt{\frac{8}{50}} = \frac{1}{2} \sqrt{\frac{4}{25}} = \frac{1}{2} \frac{\sqrt{4}}{\sqrt{25}} = \frac{1 \rightarrow 2}{2 \rightarrow 5}$$

$$\frac{2}{10} = \frac{1}{5}$$

$$\sqrt{\frac{2}{3}} \sqrt{\frac{5}{3}}$$

$$\frac{\sqrt{2} \rightarrow \sqrt{5}}{\sqrt{3} \cdot \sqrt{3}}$$

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

$$\sqrt{\frac{10}{9}} = \frac{\sqrt{10}}{\sqrt{9}} = \frac{\sqrt{10}}{3}$$



# Homework Assignment

## Worksheet "Rationalize the Denominator"

