

# MODULE 7: RADICAL PROPERTIES

*"SUCCESSFUL PEOPLE NEVER WORRY ABOUT WHAT OTHERS ARE DOING."*

## 6.3 ADDING AND SUBTRACTING RADICALS

Combine radicals with the same \_\_\_\_\_ (term under radical).

Ex. Simplify  $5\sqrt{3} + 2\sqrt{3}$

Ex. Simplify  $2\sqrt{3} + 4\sqrt{5} - 6\sqrt{3} + \sqrt{5}$

Ex. Simplify  $2\sqrt{x} + 7\sqrt{x}$

Ex. Simplify  $7\sqrt{3x} + 2\sqrt{3x}$

Ex. Simplify  $5 + 3\sqrt{x} + 4x$

## Simplifying Radicals

Simplify the radicals before adding and subtracting like terms.

Ex. Simplify  $\sqrt{45} - \sqrt{27}$

Ex. Simplify  $5\sqrt{8} + 2\sqrt{18}$

Ex. Simplify  $2\sqrt{24x^2} - x\sqrt{54}$

Ex. Simplify  $2\sqrt{32x} - 6\sqrt{5y} + 5\sqrt{200x} + 3\sqrt{125y}$

### Homework Checklist

*Section 6.3 Adding and Subtracting Radicals*

## 6.4 MULTIPLYING AND DIVIDING RADICALS

### Multiplying Radicals

If multiplying, the radicand doesn't need to be the \_\_\_\_\_.

Multiply outside to \_\_\_\_\_ and inside to \_\_\_\_\_.

*(outside $\sqrt{inside}$ ) (outside $\sqrt{inside}$ )*

When you are done multiplying, \_\_\_\_\_ the radicals.

Ex. Simplify  $(\sqrt{5})(3\sqrt{2})$

Ex. Simplify  $(\sqrt{6x})(\sqrt{8x})$

Ex. Simplify  $(2\sqrt{5x^3})(3\sqrt{4x^6})$

Ex. Simplify  $(4\sqrt{2x})(3\sqrt{14y})$

\_\_\_\_\_ radicals into an expression by distributing.

Ex. Simplify  $(\sqrt{2})(7\sqrt{3} + 9)$

Ex. Simplify  $-8(4\sqrt{11} - \sqrt{13})$

Ex. Simplify  $(4\sqrt{5})(3\sqrt{5} - 6)$

### **Square of a square root**

When you square a square root, the square root \_\_\_\_\_.

Ex. Simplify  $(\sqrt{5})^2$

Ex. Simplify  $(\sqrt{x - 3})^2$

Ex. Simplify  $(3\sqrt{2})^2$

**F.O.I.L.**

Ex. Simplify  $(3\sqrt{2} - 4)(\sqrt{2} + 3)$

Ex. Simplify  $(3\sqrt{6} - 2)(2\sqrt{6} + 5)$

Ex. Simplify  $(\sqrt{7} - 3)^2$

**Division**

Ex. Simplify  $\frac{\sqrt{40}}{\sqrt{5}}$

Ex. Simplify  $\frac{\sqrt{84}}{\sqrt{3}}$

Ex. Simplify  $\frac{\sqrt{32x^6}}{\sqrt{2x^2}}$

Ex. Simplify  $\frac{\sqrt{200x^{11}}}{\sqrt{4x}}$

### 6.5. RATIONALIZING A DENOMINATOR

When dealing with radicals, never have one in the \_\_\_\_\_.

Rationalize the denominator: \_\_\_\_\_ radical from denominator.

\_\_\_\_\_ the numerator and denominator (top and bottom)

by the \_\_\_\_\_ in the denominator.

Example: Rationalize the denominator  $\frac{1}{\sqrt{2}}$

1. Multiply the top and bottom by the radical in the denominator

2. Simplify the rational expression (if necessary)

Example: Rationalize the denominator

1.  $\frac{4}{\sqrt{2}}$

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

3.  $\frac{2x}{\sqrt{10x}}$

4.  $\frac{6}{\sqrt{5xy}}$

#### Homework Checklist

- Section 6.4 Multiplying and Dividing Radicals*
- Section 6.5 Rationalizing Radicals*
- Module 7: Radicals*