

## Section 10.5: Rationalizing Denominators and Numerators of Radical Expressions.

### Objectives:

1. Rationalize denominators
2. Rationalize denominators having two terms
3. Rationalize numerators.

### Objective 1: Rationalize denominators

The process of writing a fraction with out radical symbols in the denominator is called **rationalizing the denominator**.

### Examples:

Rationalize each denominator  $\frac{7}{\sqrt{2}}$        $\frac{2\sqrt{9}}{\sqrt{16y}}$        $\sqrt[3]{\frac{2}{25}}$

Rationalize the denominator  $\frac{\sqrt{5m}}{\sqrt{11n}}$        $\frac{\sqrt[5]{a^2}}{\sqrt[5]{32b^{12}}}$

### Objective 2: Rationalize denominators having two terms

Recall the product of the sum and difference to two terms:  $(a + b)(a - b) = a^2 - b^2$ ; the two expressions  $(a + b)$  and  $(a - b)$  are called **conjugates**.

Find the conjugates: (1)  $\sqrt{2} + x$       (2)  $5 - \sqrt{a}$       (3)  $7\sqrt{5} + 8\sqrt{x}$

What happens when we multiply an expression by its conjugate?

See formula above...

### Examples:

Rationalize each denominator  $\frac{3}{2\sqrt{5} + 1}$        $\frac{\sqrt{5} + 3}{\sqrt{3} - \sqrt{2}}$        $\frac{4\sqrt{x}}{2 - \sqrt{x}}$

### Objective 3: Rationalize numerators

### Examples:

Rationalize the numerator  $\frac{\sqrt{18}}{\sqrt{75}}$        $\frac{\sqrt[3]{3a}}{\sqrt[3]{7b}}$        $\frac{\sqrt{x} + 5}{3}$

