

## GUIDED NOTES – 2.6 OTHER TYPES OF EQUATIONS

### LEARNING OBJECTIVES

In this section, you will:

- Solve equations using rational exponents.
- Solve equations using factoring.
- Solve radical equations.
- Solve absolute value equations.
- Solve other types of equations.

### SOLVING EQUATIONS INVOLVING RATIONAL EXPONENTS

- Rational exponents are exponents that are fractions, where the numerator is a \_\_\_\_\_ and the denominator is a \_\_\_\_\_.
- We can solve equations in which a variable is raised to a rational exponent by raising both sides of the equation to the \_\_\_\_\_ of the exponent.

*Study the box in your textbook section titled “rational exponents.”*

- List the 4 ways that you can rewrite  $a^{\frac{m}{n}}$  below.

**Try It:** Read Example 1 in the text, then answer the following.

Evaluate  $64^{\frac{2}{3}}$ .

**Try It:** Read Example 2 in the text, then answer the following.

Solve the equation  $x^{\frac{3}{2}} = 125$ .

**Try It:** Read Example 3 in the text, then answer the following.

Solve:  $(x + 5)^{\frac{3}{2}} = 8$ .

**Homework:** You should now be ready to attempt problems 1-2 in “Homework – Section 2.6” on WeBWorK.

### SOLVING EQUATIONS USING FACTORING

- We have used factoring to solve quadratic equations, but it is a technique that we can use with many types of polynomial equations. When we are faced with an equation containing polynomials of degree higher than \_\_\_\_\_, we can often solve them by factoring.

*Study the box in your textbook section titled “polynomial equations.”*

- Setting a polynomial equal to \_\_\_\_\_ gives us a polynomial equation. The total number of solutions (real and complex) to a polynomial equation is equal to \_\_\_\_\_.

**Try It:** Read Example 4 in the text, then answer the following.

Solve by factoring:  $12x^4 = 3x^2$ .

**Try It:** Read Example 5 in the text, then answer the following.

Solve by grouping:  $x^3 + 3x^2 - 25x - 75 = 0$

**Homework:** You should now be ready to attempt problems 3-6 in “Homework – Section 2.6” on WeBWorK.

## SOLVING RADICAL EQUATIONS

- \_\_\_\_\_ are equations that contain variables in the radicand. We must be careful when solving these equations because you can find \_\_\_\_\_ which are roots that are not solutions to the equations. Checking your answer in the original equation will confirm the true solutions.
- Write out the 5 step process for solving a radical equation.
  - 1.
  - 2.
  - 3.
  - 4.
  - 5.

**Try It:** Read Example 6 in the text, then answer the following.

Solve the radical equation:  $\sqrt{x + 3} = 3x - 1$

**Homework:** You should now be ready to attempt problems 7-9 in "Homework – Section 2.6" on WeBWork.

## SOLVING AN ABSOLUTE VALUE EQUATION

Study the box in your textbook section titled “absolute value equations.”

- The absolute value of  $x$  is written as  $|x|$ . Fill in its properties below:

If \_\_\_\_\_, then  $|x| = x$ .

If  $x < 0$ , then  $|x| =$  \_\_\_\_\_.

- Given an absolute value equation in the form  $|ax + b| = c$ , fill in its properties below:

$|ax + b| = c$  has no solution if \_\_\_\_\_.

$|ax + b| = c$  has one solution if \_\_\_\_\_.

$|ax + b| = c$  has two solutions if \_\_\_\_\_.

- Write out the 2 step process for solving an absolute value equation.

1.

2.

**Try It:** Read Example 8 in the text, then answer the following.

Solve the absolute value equation:  $|1 - 4x| + 8 = 13$ .

**Homework:** You should now be ready to attempt problems 11-14 in “Homework – Section 2.6” on WeBWork.

## SOLVING OTHER TYPES OF EQUATIONS

- Write out the 6 step process for solving an equation in quadratic form.

1.

2.

3.

4.

5.

6.

**Try It:** Read Example 9 in the text, then answer the following.

Solve using substitution:  $x^4 - 8x^2 - 9 = 0$ .

**Homework:** You should now be ready to attempt problems 11-14 in “Homework – Section 2.6” on WeBWorK.

**Try It:** Read Example 11 in the text, then answer the following.

$$\text{Solve } \frac{3x+2}{x-2} + \frac{1}{x} = \frac{-2}{x^2-2x}.$$