

Section P.2 Solving Equations

Objective: In this lesson you learned how to solve linear and nonlinear equations.

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Equation

Extraneous solution

Quadratic equation

I. Equations and Solutions of Equations (Page 12)

To **solve** an equation in x means to . . .

What you should learn
How to identify different types of equations

The values of x for which the equation is true are called its

_____.

An **identity** is . . .

A **conditional equation** is . . .

II. Linear Equations (Pages 12–14)

A **linear equation** in one variable x is an equation that can be written in the standard form _____, where a and b are real numbers with $a \neq$ _____.

What you should learn
How to solve linear equations in one variable

A linear equation has _____ solution(s).

To solve a conditional equation in x , . . .

An equation can be transformed into an equivalent equation by one or more of the following steps:

(1)

(2)

(3)

(4)

If a contradictory statement such as $9 = 0$ is obtained while solving an equation, then the equation has _____.

Example 1: Solve $5(x + 3) = 35$.

To solve an equation involving fractional expressions, . . .

When is it possible to introduce an extraneous solution?

Example 2: Solve: (a) $\frac{5x}{7} = \frac{9}{14}$ (b) $\frac{1}{x+1} + \frac{5x}{x^2-1} = \frac{4}{x-1}$

III. Quadratic Equations (Pages 15–17)

To solve a quadratic equation by factoring, . . .

What you should learn
How to solve quadratic equations by factoring, extracting square roots, and using the Quadratic Formula

Example 3: Solve $x^2 - 12x = -27$ by factoring.

The equation $u^2 = c$, where $c > 0$, has exactly two solutions:

$u = \underline{\hspace{2cm}}$ and $u = \underline{\hspace{2cm}}$. These

solutions can also be written as $u = \underline{\hspace{2cm}}$.

Solving an equation of the form $u^2 = c$ without going through the steps of factoring is called _____.

Example 4: Solve $5(x-4)^2 = 45$ by extracting square roots.

If $ax^2 + bx + c = 0$, then the **Quadratic Formula** gives the solutions as $x =$ _____

A verbal statement of the Quadratic Formula is . . .

Example 5: For the quadratic equation $16 - 3x = -2x^2$, find the values of a , b , and c to be substituted into the Quadratic Formula.

IV. Polynomial Equations of Higher Degree (Page 18)

One approach to solving nonquadratic polynomial equations is to . . .

| |
|--|
| <p><i>What you should learn</i> How to solve polynomial equations of degree three or greater</p> |
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Example 6: Describe a strategy for solving the polynomial equation $x^3 + 2x^2 - x = 2$. Then find the solutions.

Example 7: Solve the equation:
 $x^4 - 4x^2 - 45 = 0$

V. Radical Equations (Page 19)

Operations that can introduce extraneous solutions include, . . .

What you should learn
How to solve equations
involving radicals

If any of these operations is performed while solving an equation, . . .

Example 8: Describe a strategy for solving the following equation involving a radical expression:

$$\sqrt{8-x} - 15 = 0$$

VI. Absolute Value Equations (Page 20)

To solve an equation involving an absolute value, . . .

What you should learn
How to solve equations
involving absolute values

Example 9: Write the two equations that must be solved to solve the absolute value equation $|3x^2 + 2x| - 5 = 0$.

Example 10: Solve $|x^2 + 4x| - 5 = 0$.

Homework Assignment

Page(s)

Exercises