

Section P.4 Solving Equations Algebraically and Graphically

Course Number

Instructor

Date

Objective: In this lesson you learned how to solve linear equations, quadratic equations, polynomial equations, equations involving radicals, equations involving fractions, and equations involving absolute values.

Important Vocabulary

Define each term or concept.

Equation**Extraneous** **x -intercept** **y -intercept****Point of intersection**

I. Equations and Solutions of Equations (Pages 38–39)

To solve an equation in x means to . . .

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

_____.

An identity equation is . . .

A conditional equation is . . .

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 $a \neq$ _____.

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

To solve an equation involving fractional expressions, . . .

What you should learn

How to solve linear equations

When is it possible to introduce an extraneous solution?

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

II. Intercepts and Solutions (Pages 39–41)

To find the x -intercepts of the graph of an equation, . . .

To find the y -intercepts of the graph of an equation, . . .

What you should learn
How to find x - and
 y -intercepts of graphs of
equations

Example 3: For the equation $3x - 4y = 12$, find:
(a) the x -intercept(s), and (b) the y -intercept(s).

III. Finding Solutions Graphically (Pages 41–42)

To use a graphing utility to graphically approximate the solutions of an equation, . . .

What you should learn
How to find solutions of
equations graphically

Example 4: Use a graphing utility to approximate the solutions of $3x^2 - 14x = -8$.

IV. Points of Intersection of Two Graphs (Pages 43–44)

To find the points of intersection of the graphs of two equations algebraically, . . .

What you should learn
How to find the points of
intersection of two
graphs

To find the points of intersection of the graphs of two equations with a graphing utility, . . .

Example 5: Use (a) an algebraic approach and (b) a graphical approach to finding the points of intersection of the graphs of $y = 2x^2 - 5x + 6$ and $x - y = -6$.

V. Solving Polynomial Equations Algebraically (Pages 45–46)

List four methods for solving quadratic equations:

What you should learn
How to solve polynomial equations

To solve a quadratic equation by factoring, . . .

Example 6: Solve $x^2 - 12x = -27$ by factoring.

Using the Quadratic Formula to solve the quadratic equation written in general form as $ax^2 + bx + c = 0$ gives the solutions:

Example 7: For the quadratic equation $3x - 16 = -2x^2$, find the values of a , b , and c to be substituted into the Quadratic Formula. Then find the solutions of the equation. Round to two decimal places.

Example 8: Describe a strategy for solving the polynomial equation $x^3 + 2x^2 - x = 2$. Then find the solutions.

VI. Other Types of Equations (Pages 47–49)

An equation involving a radical expression can often be cleared of radicals by . . .

When using this procedure, remember to check for _____, which do not satisfy the original equation.

Example 9: Describe a strategy for solving the following equation involving a radical expression:

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

To solve an equation involving fractions, . . .

Example 10: Solve: $\frac{2}{x} - 1 = \frac{1}{x+1}$

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

Example 11: Write the two equations that must be solved to solve the absolute value equation $|3x^2 + 2x| - 5 = 0$.

What you should learn
How to solve equations involving radicals, fractions, or absolute values

Homework Assignment

Page(s)

Exercises