

Section 2.4 Solving Equations Algebraically

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

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Quadratic equation**Second-degree polynomial equation in x** **I. Quadratic Equations** (Pages 188–192)

List four methods for solving quadratic equations:

What you should learn

How to solve quadratic equations by factoring, extracting square roots, completing the square, and using the Quadratic Formula

To solve a quadratic equation by factoring, . . .

Example 1: Solve $x^2 - 12x = -27$ by factoring.

Extracting square roots can be used with equations of the type

 $u^2 = c$, where $c > 0$, which has exactly two solutions: $u = \underline{\hspace{2cm}}$ and $u = \underline{\hspace{2cm}}$. Thesesolutions can also be written as $u = \underline{\hspace{2cm}}$.**Example 2:** Solve $5(x - 4)^2 = 45$ by extracting square roots.

To solve a quadratic equation of the form $x^2 + bx = c$ by completing the square, add _____, which is the square of half the coefficient of x , to both sides of the equation in order to maintain equality.

When completing the square to solve a quadratic equation, if the leading coefficient is not 1, . . .

Example 3: Solve $x^2 + 10x - 8 = 0$ by completing the square.

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

Example 4: 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.

II. Polynomial Equations of Higher Degree (Page 193)

An equation is of quadratic type if . . .

What you should learn
How to solve polynomial equations of degree three or greater

Example 5: Solve the equation of quadratic type:

$$x^4 - 4x^2 - 45 = 0$$

Example 6: Describe a strategy for solving the polynomial equation $x^3 + 2x^2 - x = 2$. Then find the solutions.

III. Equations Involving Radicals (Pages 194–195)

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

What you should learn
How to solve equations involving radicals

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

Example 7: Describe a strategy for solving the following equation involving a radical expression:

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

IV. Equations Involving Fractions or Absolute Values (Pages 195–196)

To solve an equation involving fractions, . . .

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

Example 8: Solve: $\frac{2}{x} - 1 = \frac{1}{x+1}$

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

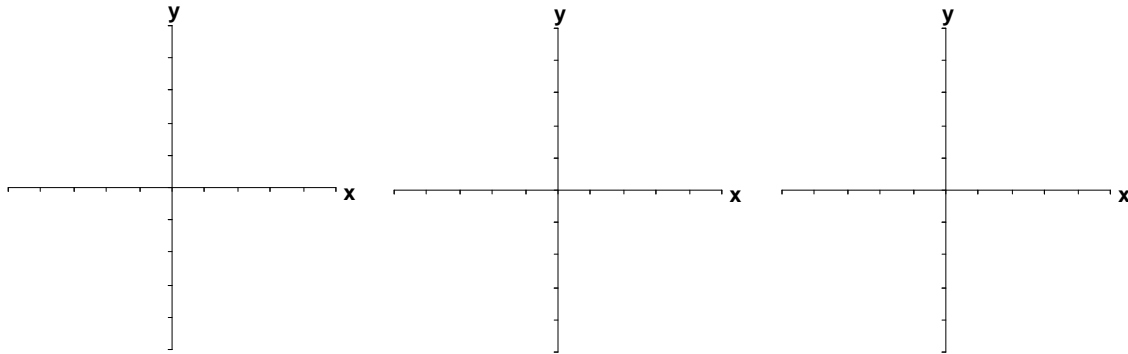
Example 9: Write the two equations that must be solved to solve the absolute value equation $|3x^2 + 2x| - 5 = 0$.

V. Applications of Quadratic Equations (Pages 197–199)

The **position equation** giving the height of an object above earth's surface is _____, where . . .

What you should learn
How to use quadratic equations to model and solve real-life problems

Describe a real-life situation in which quadratic equations often occur.

Additional notes**Homework Assignment**

Page(s)

Exercises