Solving Equations by Factoring and the Quadratic Formula Video Lecture

Sections 6.6, 6.7, 11.2

Course Learning Objective:

1) Solve quadratic equations.

2) Solve applications involving quadratic equations.

Weekly Learning Objectives:

1) Solve quadratic equations by factoring.

2) Solve equations with degree greater than 2 by factoring.

3) Solve problems that can be modeled by quadratic equations.

4) Solve quadratic equations using the quadratic formula.

Solving Equations by Factoring and the Quadratic Formula

Strategy for solving a polynomial of degree 2 or more:
   1) Remove grouping symbols and combine like terms unless the equation
      has the form $a \cdot b = 0$
   2) Get all terms on one side set equal to zero
   3) Completely factor the polynomial
   4) Set each factor containing a variable equal to zero
   5) Solve each equation
   6) Check (optional)

$$16y^2 = 25$$

$$(x+8)(x-2) = -21$$

$$(2x+1)(x+5) = (x+11)(x+3)$$

$$25y^3 = 64y$$

$$2p^3 + p^2 - 98p - 49 = 0$$

$$y^4 - 8y^2 + 16 = 0$$

The hypotenuse of a right triangle is 1 foot more than twice the length of the shorter leg. The longer leg is 1 foot less than twice the length of the shorter leg. Find the leg of the shorter leg.

If an object is propelled upward from a height of 48 feet with an initial velocity of 32 feet per second, its height h is given by the equation:

$$h = -16t^2 + 32t + 48$$

After how many seconds is the height 60 feet?

It can be shown that the object reaches its maximum height after 1 second. What is the maximum height?

A box with no top is to be constructed from a piece of cardboard whose length measures 6 inches more than its width. The box is to be formed by cutting squares that measure 2 inches on each side from the four corners, and then folding up the sides. If the volume of the box will be 110 cubic inches, what are the dimensions of the piece of cardboard?

Quadratic Formula:

The solution to $ax^2 + bx + c = 0$ is

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x^2 - 4 = 2x \qquad\qquad 9x^2 - 12x + 4 = 0$$

$$3x^2 - x = 7$$