# Section 1.4b    Quadratic Equations

**Review of Simplifying Square Roots**
*LSU Video "Simplifying Square Roots" is found on the course website.*

**Review of Evaluating Expressions that Contain Exponents**
*LSU Video "Exponents" (0:00 – 7:10) is found on the course website.*

**Objective 4:  Solving Quadratic Equations Using the Quadratic Formula**

By solving the general quadratic equation $ax^2 + bx + c = 0,\ a \neq 0$ using a method called completing the square, we obtain **the quadratic formula** which can be used to solve *any* quadratic equation.

> **The Quadratic Formula:** The solution to the quadratic equation $ax^2 + bx + c = 0,\ a \neq 0$ is given by the formula $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.

**Objective 5:  Using the Discriminant to Determine the Type of Solutions of a Quadratic Equation**

Given a quadratic equation of the form $ax^2 + bx + c = 0, \quad a \neq 0$, the expression $b^2 - 4ac$ is called the **discriminant**.  Knowing the value of the discriminate can help us determine the number and nature of the solutions to a quadratic equation.

> **The Discriminant:**  Given a quadratic equation $ax^2 + bx + c = 0, \quad a \neq 0$, the expression $D = b^2 - 4ac$ is called the **discriminant**.
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> If $D > 0$, then the quadratic equation has two real solutions.
> If $D < 0$, then the quadratic equation has two non-real solutions.
> If $D = 0$, then the quadratic equation has exactly one real solution.