**1.4 Quadratic Equations**

**CLASSROOM EXAMPLE 1 Using the Zero-Factor Property**

Solve  using the zero-factor property.

**CLASSROOM EXAMPLE 2 Using the Square Root Property**

Solve each quadratic equation using the square root property.

**(a) **

**(c) **

**The Quadratic Formula**

**Quadratic Formula**

The solutions of the quadratic equation  where  are given by the quadratic formula.



**CLASSROOM EXAMPLE 5 Using the Quadratic Formula (Real Solutions)**

Solve  using the quadratic formula.

**Solving for a Specified Variable**

**CLASSROOM EXAMPLE 8 Solving for a Quadratic Variable in a Formula**

Solve each equation for the specified variable. Use  when taking square roots.

(a)  (b) 

**The Discriminant**

**Solutions of Quadratic Equations**

|  |  |  |
| --- | --- | --- |
| **Discriminant** | **Number of Solutions** | **Type of Solutions** |
| Positive, perfect square |  |  |
| Positive, but not a perfect square |  |  |
| Zero |  |  |
| Negative |  |  |

**CLASSROOM EXAMPLE 9 Using the Discriminant**

Evaluate the discriminant for each equation. Then use it to determine the number of distinct solutions, and tell whether they are *rational*, *irrational*, or *nonreal complex* numbers.

(a)  (b)  (c) 