



## 9.3 The Quadratic Formula

### Need To Know



- The idea behind the quadratic formula
- How do we obtain the quadratic formula?
- How to use the quadratic formula
- How to memorizing the quadratic formula (9.3.B)



## Obtaining the Quadratic Formula

Solve:

$$ax^2 + bx + c = 0$$



## The Quadratic Formula

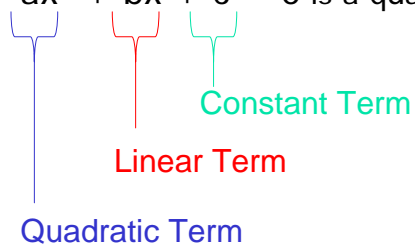
For  $ax^2 + bx + c = 0$ ,



## The Quadratic Formula

How to use the formula

$ax^2 + bx + c = 0$  is a quadratic in **standard form**.



$a$ ,  $b$ , and  $c$  are the numerical coefficients.

The formula uses only the coefficients not the  $x$ 's.

Example: Find the coefficients.

$$3x^2 - 7x + 11 = 0$$



## The Quadratic Formula

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Solve:

$$x^2 - 3x + 2 = 0$$

How To Solve

1. Put equation in standard form (it must equal 0).
2. Find a, b, c
3. Plug into the formula & simplify

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



## The Quadratic Formula

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Solve:

$$4y^2 - 4y - 3 = 0$$

How To Solve

1. Put equation in standard form (it must equal 0).
2. Find a, b, c
3. Plug into the formula & simplify

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



## The Quadratic Formula

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Solve:

$$x^2 - 4x + 4 = 5$$

How To Solve

1. Put equation in standard form (it must equal 0).
2. Find a, b, c
3. Plug into the formula & simplify

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



## The Quadratic Formula

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Solve:

$$7x^2 = 6x - 2$$

How To Solve

1. Put equation in standard form (it must equal 0).
2. Find a, b, c
3. Plug into the formula & simplify

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

## 9.3 Conclusion

### Ways to Solve Quadratic Equations

1. Factoring method (see 6.6)  
(Set up: equation must = 0)
2. Square root method  
(Set up: "squared stuff" by itself)
3. Completing the square method  
(Set up: the leading coefficient = 1)
4. Quadratic Formula  
(Set up: equation must = 0)

| Rating | Doable     |
|--------|------------|
| Easy   | Not always |
| Easy   | Not always |
| Hard   | Always     |
|        |            |

## Memorize the Quadratic Formula

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

### THE STORY

A **negative** bee could **not decide** about going to a **radical** party. At the party some **square** bees were playing poker. One of the bees **threw down 4 aces**. The whole thing was **over** at **2 am**.