

# Quadratic Formula

# Objectives

- 1 Solve quadratic equations using the quadratic formula
- 2 Use the discriminant to determine the types of solutions to a quadratic equation

# The Quadratic Formula

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$$\text{For } ax^2 + bx + c = 0$$

## Quadratic Formula

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

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Solve each of the following using the quadratic formula. Exact answers only.

(a)  $3x^2 + 8x - 28 = 0$

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$$x = 2$$

$$x = -\frac{14}{3}$$

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$$x = \frac{-9 + \sqrt{181}}{10} \quad x = \frac{-9 - \sqrt{181}}{10}$$

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- **Discriminant is negative:** No real values of  $x$  make the original equation true.
- **Discriminant is 0:** There is one value of  $x$  (called a *double root*).
- **Discriminant is positive:** There are 2 unique answers for  $x$ .



# The Discriminant

In addition, if  $\sqrt{b^2 - 4ac}$  equals a **rational number**, then the quadratic equation is factorable over the integers (only use integers in your factoring).