

Reflect

2. When the discriminant is positive, the quadratic equation has two real solutions. When the discriminant is negative, there are no real solutions. How many real solutions does a quadratic equation have if its discriminant equals 0? Explain.

Your Turn

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$$x = \frac{-b \pm \sqrt{\quad}}{2a}$$

Disc. tells you how many sol. there are. Not what the sol. is.

Use the **discriminant** to determine the number of real solutions for each quadratic equation.

3. $x^2 + 4x + 1 = 0$

$$b^2 - 4ac$$

$$(4)^2 - 4(1)(1)$$

$$16 - 4$$

Disc. $\rightarrow 12$
 (2 sol.)

$$b^2 - 4ac > 0$$

4. $2x^2 - 6x + 15 = 0$

$$b^2 - 4ac$$

$$(-6)^2 - 4(2)(15)$$

$$36 - 120$$

-84
 (No Sol.)

$$b^2 - 4ac < 0$$

5. $x^2 + 6x + 9 = 0$

$$b^2 - 4ac$$

$$(6)^2 - 4(1)(9)$$

$$36 - 36$$

0
 (One sol.)

$$b^2 - 4ac = 0$$

Explain 2 Solving Equations by Using the Quadratic Formula

To use the quadratic formula to solve a quadratic equation, check that the equation is in standard form. If not, rewrite it in standard form. Then substitute the values of a , b , and c into the formula.

Example 2 Solve using the quadratic formula.

(A) $2x^2 + 3x - 5 = 0$

$$a = 2, b = 3, c = -5$$

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

$$x = \frac{-3 \pm \sqrt{(3)^2 - 4(2)(-5)}}{2(2)}$$

$$x = \frac{-3 \pm \sqrt{49}}{4}$$

$$x = \frac{-3 \pm 7}{4}$$

$$x = \frac{-3 + 7}{4} \text{ or } x = \frac{-3 - 7}{4}$$

$$x = 1 \text{ or } x = -\frac{5}{2}$$

The solutions are 1 and $-\frac{5}{2}$.

Identify a , b , and c .

Use the quadratic formula.

Substitute the identified values into the quadratic formula.

Simplify the radicand and the denominator.

Evaluate the square root.

Write as two equations.

Simplify both equations.