10.7: Interpret the Discriminant

Goals: * Identify the discriminant of the quadratic formula
* Use the discriminant to decide the number of solutions a quadratic equation has

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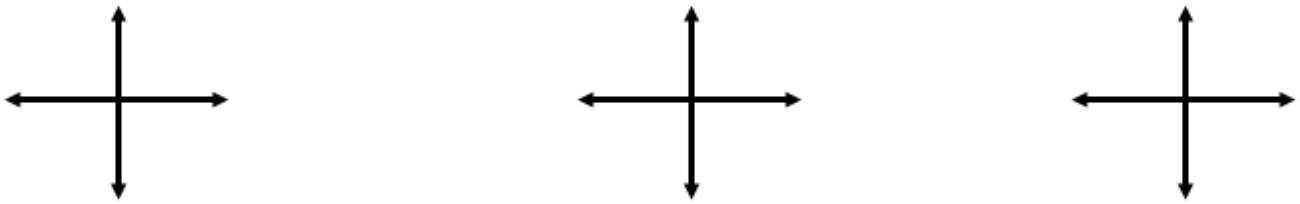
· What are the possible number of solutions a quadratic equation can have?

Sketch a parabola to represent each possibility.



Discriminant:

· What happens to the discriminant in the quadratic formula?

Use your knowledge of square roots to determine how you would use the discriminant to identify the number of solutions to a quadratic equation.

Ex: $2x^2 + 6x + 5$ **Ex:** $x^2 - 7 = 0$ **Ex:** $4x^2 - 12x + 9$

Tell whether the following equation has *two solutions*, *one solution*, or *no solution*.

Ex: $3x^2 - 7 = 2x$

Ex: $x^2 + 4x + 3 = 0$

Ex: $2x^2 - 5x + 6 = 0$

Ex: $-x^2 + 2x = 1$

Ex: $3x^2 + 8x + 7 = 0$

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

Ex: $4x^2 + 20x + 25 = 0$

Find the number of *x*-intercepts of the graph of:

Ex: $y = x^2 + 5x + 8$

Ex: $y = x^2 + 7x - 2$

Ex: $y = x^2 + 10x + 25$

Ex: $y = x^2 - 9x$

Ex: $y = -x^2 + 2x - 4$

Ex: $y = 4x^2 + 4x + 1$