

Part 1: Solving when $a = 1$

Study the examples in the presentation FIRST. Then, solve the quadratic equations below by factoring.

$$y = x^2 - x - 20$$

$$\mathbf{a} \quad x^2 + 5x + 6 = 0$$

Part 2: Solving when $a \neq 1$

Study the examples in the presentation FIRST. Then, solve the quadratic equations below by factoring.

$$\mathbf{b} \quad 2x^2 - 7x - 4 = 0$$

$$\mathbf{c} \quad 9x^2 + 6x + 1 = 0$$

Find the roots of these equations using the factorization method:

$$\mathbf{a} \quad 3x^2 - 4 = 16x + 8$$

$$\mathbf{b} \quad n(n + 8) = 5(n + 2)$$

Creating Quadratic Models

The x-intercepts of a parabola are at $x = -1$ and $x = 5$. The parabola passes through the point $(4, -10)$.

What is the equation?

Use intercept (factored) form:

$$y = a(x - p)(x - q)$$

The vertex of a parabola is at $(5, 1)$ and it passes through the point $(7, 17)$. What is the equation?

The vertex of a parabola is at $(-2, -4)$ and it passes through the point $(2, 28)$.

What is the equation?

Use vertex form:

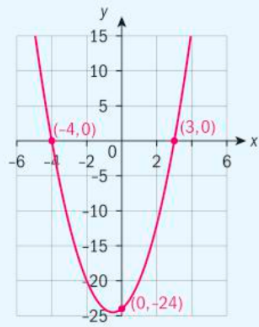
$$y = a(x - h)^2 + k$$

The x-intercepts of a parabola are at $x = -2$ and $x = 4$. The parabola passes through the point $(3, 15)$. What is the equation?

A ball is thrown up into the air, from 5 m above the ground. After 2 seconds, the ball reaches a maximum height of 9 m. It lands on the ground 5 seconds after it was thrown. **Find** a quadratic function that models this situation. Write it in standard and vertex form.

Use the information shown in the graph to find an equation for the quadratic function. Write your final answer in general form, $f(x) = ax^2 + bx + c$.

a



b

