

1.6 Standard Form of a Quadratic Function

Objective: To graph quadratic functions written in standard form.

Common Core Content Standard:

A.CED.2 Create equations in two or more variables to represent relationships between quantities, graph equations on coordinate axes with labels and scales.

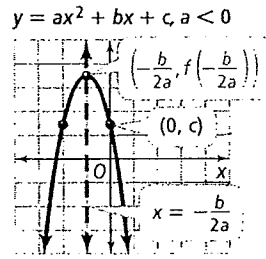
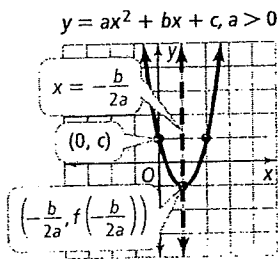
Also F.IF.4, F.IF.6, F.IF.8, F.IF.9

The _____ form of a quadratic function is $f(x) = ax^2 + bx + c$, where $a \neq 0$.



Properties Quadratic Function in Standard Form

- The graph of $f(x) = ax^2 + bx + c$, $a \neq 0$, is a parabola.
- If $a > 0$, the parabola opens upward. If $a < 0$, the parabola opens downward.
- The axis of symmetry is the line $x = -\frac{b}{2a}$.
- The x -coordinate of the vertex is $-\frac{b}{2a}$. The y -coordinate of the vertex is the y -value of the function for $x = -\frac{b}{2a}$, or $y = f(-\frac{b}{2a})$.
- The y -intercept is $(0, c)$.

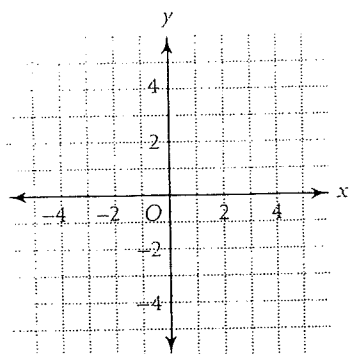


Example 1: Finding the Features of a Quadratic Function

What are the vertex, axis of symmetry, maximum or minimum value, and range of $y = -x^2 + 6x + 3$?

Example 2: Graphing a Function of the Form $ax^2 + bx + c$.

What is the graph of $y = 4x^2 - 16x + 10$?



The _____ form of a quadratic function is $f(x) = a(x-h)^2 + k$, where $a \neq 0$.

Example 3: Converting Standard Form to Vertex Form

What is the vertex form of $y = 2x^2 - 3x + 2$?

Example 4: Interpreting a Quadratic Graph

A model for the performance of a stock is $P = -3d^2 + 50d$ where d represents the days of trading and P is the price per share. What is the maximum price per share of the stock?