

Chapter 3 Polynomial Functions

Section 3.1 Quadratic Functions

Objective: In this lesson you learned how to sketch and analyze graphs of functions.

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Constant function

Linear function

Quadratic function

Axis

Vertex

I. The Graph of a Quadratic Function (Pages 254–256)

Let n be a nonnegative integer and let $a_n, a_{n-1}, \dots, a_2, a_1, a_0$ be real numbers with $a_n \neq 0$. A **polynomial function** of x with degree n is . . .

What you should learn

How to analyze graphs of quadratic functions

A quadratic function is a polynomial function of _____ degree. The graph of a quadratic function is a special “U”-shaped curve called a _____.

If the leading coefficient of a quadratic function is positive, the graph of the function opens _____ and the vertex of the parabola is the _____ y -value on the graph. If the leading coefficient of a quadratic function is negative, the graph of the function opens _____ and the vertex of the parabola is the _____ y -value on the graph. The absolute value of the leading coefficient determines _____.
_____. If $|a|$ is small, . . .

II. The Standard Form of a Quadratic Function

(Pages 257–258)

The **standard form of a quadratic function** is

_____.

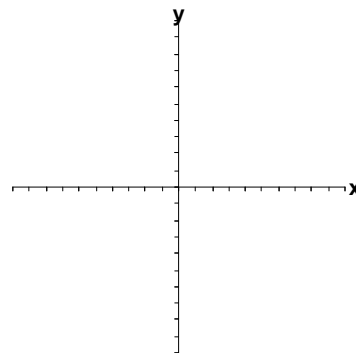
For a quadratic function in standard form, the axis of the associated parabola is _____ and the vertex is

_____.

To write a quadratic function in standard form, . . .

To find the x -intercepts of the graph of $f(x) = ax^2 + bx + c$, . . .

Example 1: Sketch the graph of $f(x) = x^2 + 2x - 8$ and identify the vertex, axis, and x -intercepts of the parabola.

**III. Applications of Quadratic Functions** (Page 259)

For a quadratic function in the form $f(x) = ax^2 + bx + c$, the x -coordinate of the vertex is given as _____ and the y -coordinate of the vertex is given as _____.

Example 2: Find the vertex of the parabola defined by $f(x) = 3x^2 - 11x + 16$.

What you should learn
How to use quadratic functions to model and solve real-life problems

Homework Assignment

Page(s)

Exercises