Name_____ Class_____ Date_____

Lesson 5-1

Modeling Data With Quadratic Functions

Lesson Objectives	NAEP 2005 Strand: Algebra
1 Identifying quadratic functions and graphs 2 Model data with quadratic functions	Topics: Patterns, Relations, and Functions; Algebraic Representations Local Standards: _____

Vocabulary and Key Concepts

Standard Form of a Quadratic Function

$f(x) = \underbrace{ax^2}_{\text{quadratic term}} + bx + \underbrace{\quad\quad}_{\text{term}} + \underbrace{c}_{\text{constant term}}$

A parabola is _____

The axis of symmetry is _____

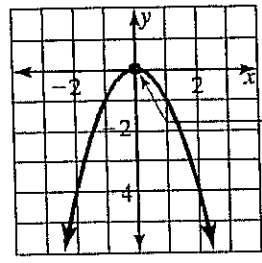
_____

The vertex of a parabola is _____

_____

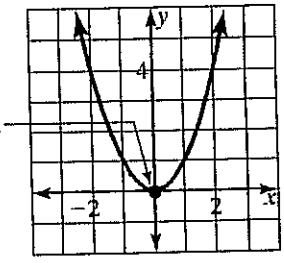
_____

_____



Maximum Value

Vertex



Minimum Value

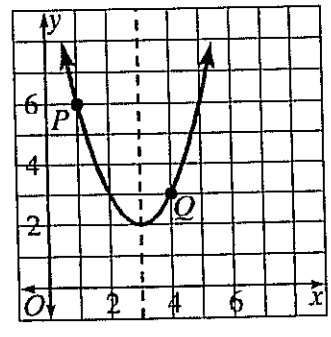
Examples

1 Points on a Parabola Below is the graph of $y = x^2 - 6x + 11$. Identify the vertex, axis of symmetry, points P' and Q' corresponding to P and Q, and the range of $f(x)$.

The vertex is $(\square, \square)$.

The axis of symmetry is $x = \square$. $P(1, 6)$ is two units to the left of the axis of symmetry. Corresponding point P' $(\square, \square)$ is two units to the _____ of the axis of symmetry.

$Q(4, 3)$ is one unit to the right of the axis of symmetry. Corresponding point Q' $(\square, \square)$ is one unit to the _____ of the axis of symmetry.

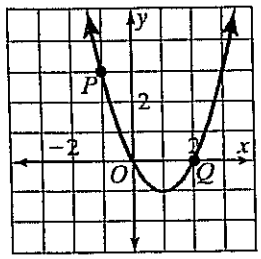


The range of this function is _____.

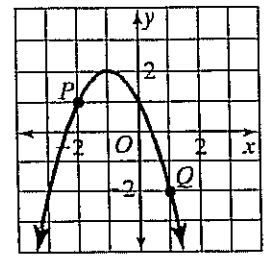
Quick Check

1. Identify the vertex and the axis of symmetry of each parabola. Identify points corresponding to P and Q.

a.



b.



2. Find a quadratic function with a graph that includes $(1, 0)$, $(2, -3)$, and $(3, -10)$.