MCF3M1

4.1 The Vertex Form of a Quadratic Function $y = a(x - h)^2 + k$

Learning Goal: To compare the standard and vertex forms of a quadratic function.
Success Criteria: standard form: $y=a x^2 + bx +c$ where a, b and c are constant and c is the y-intercept. Vertex form; $y = a(x - h)^2 + k$

- Which function should the environment club use? Problem on p. 196.

Example 1 Connecting Functions in standard Forms

a) $g(w)= - (w - 20)^2 + 400$

b) $f(w) = - w^2 + 40w$

Example 2 Connecting information about the parabola to the vertex form of the function

a. What is the maximum area of a garden defined by $f(w) = - w^2 + 40w$?

b. How does this relate to the function $g(w)= - (w - 20)^2 + 400$?

Example3 Identifying features of the parabola from a quadratic function in vertex form

a. Determine the direction of opening, the axis of symmetry, the minimum value, and the vertex of the quadratic function $f(x) = 3(x - 5)^2 + 7$.

b. Without using graphing technology, use the information you determined to sketch a graph of f(x).

Work
P204-205
4abc,
6,8ab, 9bd,
10

c. State the domain and range of f(x).

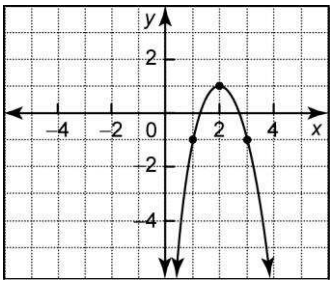
Example 4 Selecting a strategy to determine the zeros from a quadratic function in vertex form

- Determine the zeros of the function $f(x) = (x - 6)^2 - 36$

Method 1: Expanding and Factoring

Method 2: Using Inverse Operation

Example 5 Using the vertex form to write the equation of a quadratic function from its graph



Determine the equation in **vertex form** of the quadratic function shown.