

1. Given the Vertex and a Point: Write the equation of the parabola.
Let the Vertex be at (5, 1) and let a point P on the parabola be at (3, -11). Find the Equation.

Solution:

$$y = a(x - 5)^2 + 1$$

Plug in the values from point P.

$$-11 = a(2 - 5)^2 + 1$$

$$-11 = 9a + 1$$

$$9a = -12$$

$$a = -4$$

The Equation: $y = -4(x - 5)^2 + 1$.

2. Given a point on the parabola and the x-intercepts: Write the equation of the parabola.
Let Point P(5, -24) be on the parabola with x-intercepts at -1 and 3. Find the Equation.

Solution:

$$y = a(x + 1)(x - 3)$$

Plug in the values from point P.

$$-24 = a(5 + 1)(5 - 3)$$

$$-24 = a(6)(2)$$

$$-24 = 12a$$

$$a = -2$$

$$y = -2(x + 1)(x - 3)$$

$$y = -2(x^2 - 2x - 3)$$

The Equation: $y = -2x^2 + 4x + 6$.

Assignment 120

Page 80, #'s 3-14 (Remember to Write the Problem, including the graphs for 3, 4, 9, 10.)