Lesson 16: Graphing Quadratic Equations from the Vertex Form,

Classwork

Opening Exercise

Graph the equations , , and on the interval

Exercises 1–2

1. Without graphing, state the vertex for each of the following quadratic equations.
2. Write a quadratic equation whose graph will have the given vertex.

**Exploratory Challenge**

Caitlin has feet of material that can be used to make a fence. Using this material, she wants to create a rectangular pen for her dogs to play in. What dimensions will maximize the area of the pen?

* 1. Let be the width of the rectangular pen in feet. Write an expression that represents the length when the width is feet.
  2. Define a function that describes the area,, in terms of the width,.
  3. Rewrite in vertex form.
  4. What are the coordinates of the vertex? Interpret the vertex in terms of the problem.
  5. What dimensions maximize the area of the pen? Do you think this is a surprising answer?

Problem Set

Lesson Summary

When graphing a quadratic equation in vertex form, , are the coordinates of the vertex.

1. Find the vertex of the graphs of the following quadratic equations.
2. Write a quadratic equation to represent a function with the following vertex. Use a leading coefficient other than .
3. Use vocabulary from this lesson (i.e., stretch, shrink, opens up, opens down, etc.) to compare and contrast the graphs of the quadratic equations and .