**6.4 Vertex Form of a Quadratic Function**

Name: Date:

Vertex Form: y = a(x – h)2 + k, where h is the x-coordinate of the vertex and k is the y-coordinate of the vertex.

If the value of a is positive the parabola opens up and if a is negative the parabola opens down.

Ex. 1) Sketch the graph of f(x) = 2(x – 3)2 – 4 and state the domain, range and equation of axis of symmetry.

Ex. 2) A parabola has a vertex of (12, 47.5) and a second point on the graph of (10, 85.3). Determine the equation that represents the function.

Ex. 3) A soccer ball is kicked form the ground. After 2 s, the ball reaches its maximum height of 20 m. It lands on the ground at 4 s.

1. Determine the quadratic function that models the height of the kick.
2. Determine any restrictions that must be placed on the domain and range of the function.
3. What was the height of the ball at 1 s? When was the ball at the same height on the way down?

**6.4 Vertex Form of a Quadratic Function**

Name: Date:

The vertex form of a quadratic function has the form y = a(x – h)2 + k. Using the graphs that are pictured below and their related formulas, determine the vertex of each graph, the axis of symmetry, and the way the parabola opens (up or down).

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| --- | --- |
| Quadratic Function 1.JPG | **Looking at the graph…**Vertex: Axis of Symmetry:Opens Up or Down?**Looking at the equation…**Value of a:Value of h:Value of k: |
| Quadratic Function 2.JPG | **Looking at the graph…**Vertex: Axis of Symmetry:Opens Up or Down?**Looking at the equation…**Value of a:Value of h:Value of k: |
| Quadratic Function 3.JPG | **Looking at the graph…**Vertex: Axis of Symmetry:Opens Up or Down?**Looking at the equation…**Value of a:Value of h:Value of k: |
| Quadratic Function 4.JPG | **Looking at the graph…**Vertex: Axis of Symmetry:Opens Up or Down?**Looking at the equation…**Value of a:Value of h:Value of k: |
| Quadratic Function 5.JPG | **Looking at the graph…**Vertex: Axis of Symmetry:Opens Up or Down?**Looking at the equation…**Value of a:Value of h:Value of k: |
| Quadratic Function 6.JPG | **Looking at the graph…**Vertex: Axis of Symmetry:Opens Up or Down?**Looking at the equation…**Value of a:Value of h:Value of k: |

Look for relationships between the vertex form of the equation and the graph itself.

**Describe** any relationships that you see between the value of h and the vertex.

**Describe** any relationships that you see between the value of k and the vertex.

**Describe** any relationships that you see between the value of a and the direction the parabola opens up.