**3.1 Quadratic Functions and Models**

**CLASSROOM EXAMPLE 1 Graphing Quadratic Functions**

Graph each function. Give the domain and range.

|  |  |  |
| --- | --- | --- |
| **(a)**  | **(b)**  | **(c)**  |
| **Dotted_grid_full_10_X_10** | **Dotted_grid_full_10_X_10** | **Dotted_grid_full_10_X_10** |

**The Vertex Formula** ****

**CLASSROOM EXAMPLE 4 Using the Vertex Formula**

Find the axis and vertex of the parabola having equation  using the vertex formula.

**Quadratic Models**

**CLASSROOM EXAMPLE 5 Solving a Problem Involving Projectile Motion**

A ball is projected directly upward from an initial height of 75 ft with an initial velocity of 112 ft per sec.

**Projectile height function: **

**(a)** Give the function that describes the height of the ball in terms of time *t*.

**(b)** After how many seconds does the ball reach its maximum height? What is this maximum height?

**(c)** For what interval of time is the height of the ball greater than 200 ft?

**(d)** After how many seconds will the ball hit the ground?