8-7

Practice

Modeling Motion Using Parametric Equations

Find the initial horizontal and vertical velocity for each situation.

1. a soccer ball kicked with an initial velocity of 39 feet per second at an angle of 44° with the ground

2. a toy rocket launched from level ground with an initial velocity of 63 feet per second at an angle of 84° with the horizontal

3. a football thrown at a velocity of 10 yards per second at an angle of 58° with the ground

4. a golf ball hit with an initial velocity of 102 feet per second at an angle of 67° with the horizontal

5. ***Model Rocketry*** Manuel launches a toy rocket from ground level with an initial velocity of 80 feet per second at an angle of 80° with the horizontal.

a. Write parametric equations to represent the path of the rocket.

b. How long will it take the rocket to travel 10 feet horizontally from its starting point? What will be its vertical distance at that point?

6. ***Sports*** Jessica throws a javelin from a height of 5 feet with an initial velocity of 65 feet per second at an angle of 45° with the ground.

a. Write parametric equations to represent the path of the javelin.

b. After 0.5 seconds, how far has the javelin traveled horizontally and vertically?