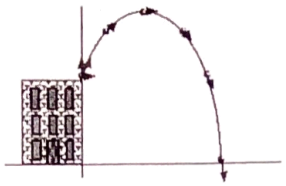

PROJECTILE MOTION *Problems*

1. A soccer ball is kicked from the ground with an initial upward velocity of 90 feet per second. The equation $h = -16t^2 + 90t$ gives the height h of the ball after t seconds.

   a. Find the maximum height of the ball.

   b. How many seconds will it take for the ball to reach the ground?

1a. _____

b. _____

2. An apple is launched directly upward at 64 feet per second from an 80-foot tall platform. The equation for this apple's height h at time t seconds after launch is $h = -16t^2 + 64t + 80$.

   a. Find the maximum height of the apple.

   b. How many seconds will it take for the apple to reach the ground?

2a. _____

b. _____

3. In science class, the students were asked to create a container to hold an egg. They would then drop this container from a window that is 25 feet above the ground. If the equation of the container's pathway can be modeled the equation $h = -16t^2 + 25$, how long will it take the container to reach the ground?

   a. Find the maximum height of the container.

   b. How many seconds will it take for the container to reach the ground?

3a. _____

b. _____

4. A penny is dropped off the Empire State Building, which is 1,250 feet tall. If the penny's pathway can be modeled by the equation $h = -16t^2 + 1250$, how long would it take the penny to strike a 6-foot tall person?

4. _____

5. Some fireworks are fired vertically into the air from the ground at an initial speed of 80 feet per second. The equation for this object's height h at time t seconds after launch is $h = -16t^2 + 80t$. How long will it take the fireworks to reach the ground?

5. _____

6. The Apollo's Chariot, a rollercoaster at Busch Gardens, moves at 110 feet per second. The equation of the ride can be represented by the equation $h = -16t^2 + 101t + 10$. What is the maximum height reached by this ride?

6. _____

7. Eva is jumping on a trampoline. Her height h at time t can be modeled by the equation $h = -16t^2 + 20t + 6$. Would Eva reach a height of 14 feet?

7. _____

8. An astronaut on the Moon throws a baseball upward with an initial velocity of 10 meters per second, letting go of the baseball 2 meters above the ground. The equation of the baseball pathway can be modeled by $h = -0.8t^2 + 10t + 2$. The same experiment is done on Earth, in which the pathway is modeled by equation $h = -4.9t^2 + 10t + 2$. How much longer would the ball stay in the air on the Moon compared to on Earth?

8. _____