

C. Firing the Cannons on *Constitution*, using projectile motion to explore maximums and zeros

A 24-pound cannonball is fired from the spar deck of USS *Constitution*, 32 ft above sea level. The initial vertical velocity of the cannonball is 320 ft/s.

1. Write an equation for the vertical height of the cannonball after t seconds.
2. After 3 seconds, what is the height of the cannonball?
3. When will the cannonball reach its maximum height? What is the maximum height?
4. Suppose the cannonball misses the target. When will it hit the water again?
5. A cannonball is fired and hits a ship. The cannonball tears through the port side of the enemy vessel 24 ft. up. How long did it take for the cannonball to reach its destination?

