

MA205 - Integral Calculus
Lesson 36: Motion In Space I

1. An athlete throws a shot at an angle of 45° from the horizontal and with an initial speed of 43 ft/sec. It leaves his hand 7 feet above the ground.
 - (a) Where does the shot land?
 - (b) How high does the shot go?
 - (c) What is the length of the flight path?

2. Your crazy Uncle Jimbo is at the top of a 300 meter tower and intends to test his new pumpkin launcher. He's really outdone himself this time; the launcher is capable of launching pumpkins with a speed of 200 m/s. The launcher is set at an angle of 30° from the horizontal.
- (a) Where does the pumpkin land if there is no wind?
 - (b) Where does the pumpkin land if there is a headwind of 12 m/s?
3. Fenway Park presents a unique challenge to hitters in the form of the *Green Monster* - a 37-foot high wall in left field. Down the left field line, the distance from home plate to the Green Monster is 310 feet. David Ortiz connects with a Randy Johnson fastball 3 feet above home plate and drives it down the left field line at an angle of 42° . It clears the Green Monster by 10 feet, and the Red Sox celebrate another homer by the Big Papi. Find the initial speed of the ball.