1. You and your army decide to attack a castle by shooting cannonballs. The enemy is trying to retreat so you decide to destroy the draw bridge to prevent them from escaping. The draw bridge is 200m away from the cannon which shoots at an angle of 30 degrees. What velocity must you shoot the cannonball at to destroy the bridge.

2. Russell is a world class long jumper. His personal goal is to achieve a jump of 8.40m. If Russell’s takeoff speed is 9.4m/s between which angles will allow him at least to reach his goal. The world record for a long jump is 8.95m, could Russell achieve this distance? \(2 \sin \theta \cos \theta = \sin 2\theta\)

3. During the 1997 NBA Western Conference finals the Houston Rockets were tied with the Utah jazz 100-100 with 2.8 seconds left. The Jazz inbounds the ball to John Stockton at the 3pt line 23.75ft from the basket for a chance to win. If Stockton’s release point is 6ft from the ground and he releases the ball with an angle of 58 degrees, what is velocity of his release that go into the in the hoop that is 10ft tall. \(g=32.174 \text{ ft/s}^2\)