The problems for Lecture 6 are Chapter 4 problems 18, 23, 28, 38, 41 from the text.

The problems for Lecture 7 are Chapter 4 problems 45, 47, 50, 63 from the text.

The following additional problems are also assigned.

1. In a very popular lecture demonstration, a projectile is fired; leaving the gun at the same time the target is dropped from rest. Show that if the gun is initially aimed at the target, the projectile will hit the target. (The figure is on the right [Serway 1994].)

2. The orbit of the Moon about the Earth is approximately circular, with a mean radius of $3.84 \times 10^8$ m. It takes 27.3 days for the Moon to complete one revolution around the Earth. Find (a) the mean orbital speed of the Moon and (b) its centripetal acceleration. (Serway 1994)

3. A science student is riding on a flatcar of a train that is traveling along a straight horizontal track at a constant speed of 10 m/s. The student throws a ball into the air along a path that he judges to make an initial angle of $60^\circ$ with the horizontal and in line with the track. The student’s professor, who is standing on the ground nearby, observes the ball to rise vertically. How high does the ball rise? (Serway 1994)