Honors Physics 1D Kinematics HW, part 2 (Homework)

1.
A ball is thrown vertically upward with a speed of 12.0 m/s.
(a) How high does it rise?
(b) How long does it take to reach its highest point?
(c) How long does it take to hit the ground after it reaches its highest point?
(d) What is its speed when it returns to the level from which it started?

2.
A small mailbag is released from a helicopter that is descending steadily at 3.00 m/s. After 2.00 s,
(a) what is the speed of the mailbag, and
(b) how far is it below the helicopter?
(c) What are your answers to parts (a) and (b) if the helicopter is rising steadily at 3.00 m/s?

3.
A ball thrown vertically upward is caught by the thrower after 10.00 s. Find
(a) the initial velocity of the ball and
(b) the maximum height it reaches.

4.
A parachutist with a camera, both descending at a speed of 15 m/s, releases that camera at an altitude of 140 m.
(a) How long does it take the camera to reach the ground?
(b) What is the velocity of the camera just before it hits the ground?

5.
A bullet is fired through a board 7.0 cm thick in such a way that the bullet's line of motion is perpendicular to the face of the board. If the initial speed of the bullet is 350 m/s and it emerges from the other side of the board with a speed of 250 m/s, find
(a) the acceleration of the bullet as it passes through the board and
(b) the total time the bullet is in contact with the board.

6.
A ranger in a national park is driving at 34.0 mi/h when a deer jumps into the road 260 ft ahead of the vehicle. After a reaction time of t, the ranger applies the brakes to produce an acceleration of a = -9.00 ft/s^2. What is the maximum reaction time allowed if she is to avoid hitting the deer?