

Name _____

- You have 15 minutes
- No calculators
- Show sufficient work

1. (3 points) A bullet is shot upward from the surface of a planet so that its height in meters until coming to rest is given by the equation $s(t) = 210t - 3.5t^2$ where t is measured in seconds. Answer the following questions and be sure to use proper units in each answer.

(a) What is the acceleration due to gravity on this planet?

(b) What is the bullet's initial velocity?

(c) How long does it take for the bullet to reach its maximum height?

2. (4 points) A ladder 10 feet long rests against a vertical wall. If the bottom of the ladder slides away from the wall at a rate of 1.5 feet per second, how quickly in radians per second is the angle between the ladder and the wall increasing when the bottom of the ladder is 8 feet from the wall?

3. (3 points) Suppose that A represents the number of grams of a radioactive substance at time t seconds. Given that $\frac{dA}{dt} = -0.2A$, how long does it take 18 grams of this substance to be reduced to 6 grams?