Planet Holloway **websheet 3.3** *AP Physics C* - Chapter 3 You may print this out and write on it or work on your own paper. **Show all work.** 

1. A ball's position is described by the equation  $x = 12t - 14t^3$ . What is the ball's velocity at 4 seconds? What is its acceleration at 4 seconds?

2. An object moves such that  $a = 6t^2$ . What is the object's velocity at 3 seconds, if it started with an initial velocity of -3 m/s? What is its position at 3 seconds?

3. A car has a velocity given by v = 2t + 5. What is its acceleration at 4 seconds? What is its position at 4 seconds?

4. The position of a bumblebee is given by  $x = 9t + 0.1t^2$ . If the bumblebee continues to maintain this motion, what is the velocity and acceleration of the bee at 5 seconds?

5. A car has a velocity given by  $v = 3t+0.7t^3$ . What is the position of the car at 4 seconds? What is the car's acceleration at 4 seconds? Is the acceleration increasing or decreasing?

6. The horizontal acceleration of an object is described by a = 4 + 12t. What is the velocity and position of the object at 7 seconds if the object started from rest?

## Answers:

I assumed standard SI units for all the following answers:

- 1. v = -660 m/s, a = -336 m/s/s
- 2. v = 51 m/s, x = 31.5 m
- 3. a = 2 m/s/s, x = 36 m
- 4. v = 10 m/s, a = 0.2 m/s/s
- 5. x = 68.8 m, a = 36.6 m/s/s, increasing
- 6. v = 322 m/s, x = 784 m