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