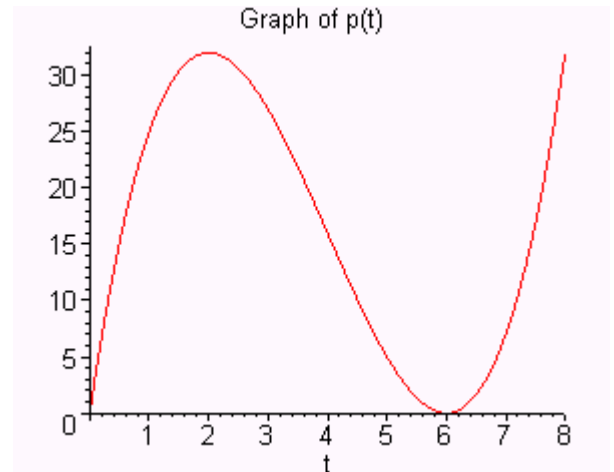


I. The position (in feet) of a particle moving along a straight path is given by the function $p(t) = t^3 - 12t^2 + 36t$, $t \geq 0$ where t is in seconds. A graph of p is given below for your reference. Please answer the following (12 points total).

(a) Find all times at which the velocity of the particle is zero. (4 points)

(b) Find all times at which the acceleration of the particle is zero, all times at which the acceleration of the particle is negative and all times at which the acceleration of the particle is positive. (6 points)



(c) Describe the motion of the particle along the path using English sentences. You should indicate when the particle moves forward, backward, speeds up, and slows down. (2 points)

II. An ice cube stays in the shape of a cube as it melts (a very nice assumption!). If the sides of the cube are decreasing at the rate of one inch per hour, find the rate of change of the volume of the cube when the volume is eight cubic inches. Clearly indicate the meaning of all variable names and write your answer using a complete English sentence. (8 points)