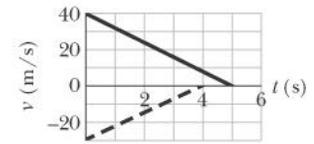


## HOMWORK - CHAPTER 2

- 6 Compute your average velocity in the following two cases: (a) You walk 73.2 m at a speed of 1.22 m/s and then run 73.2 m at a speed of 3.05 m/s along a straight track. (b) You walk for 1.00 min at a speed of 1.22 m/s and then run for 1.00 min at a speed of 3.05 m/s along a straight track. (c) Graph  $x$  versus  $t$  for both cases and indicate how the average velocity is found on the graph.

••13 The position of a particle moving along the  $x$  axis is given in centimeters by  $x = 9.75 + 1.50t^3$ , where  $t$  is in seconds. Calculate (a) the average velocity during the time interval  $t = 2.00$  s to  $t = 3.00$  s; (b) the instantaneous velocity at  $t = 2.00$  s; (c) the instantaneous velocity at  $t = 3.00$  s; (d) the instantaneous velocity at  $t = 2.50$  s; (e) the instantaneous velocity when the particle is midway between its positions at  $t = 2.00$  s and  $t = 3.00$  s. (f) Graph  $x$  versus  $t$  and indicate your answers to (e) graphically.

••35 As two trains move along a track, their conductors suddenly notice that they are headed towards each other. The figure to the right gives their velocities  $v$  as a function of time  $t$  as the conductors slow the trains. The slowing process begins when the trains are 200 m apart. What is their separation when both trains have stopped?



••62 When a soccer ball is kicked toward a player and the player deflects the ball by “heading” it, the acceleration of the head during the collision can be significant. The figure to the right gives the measured acceleration  $a(t)$  of a soccer player’s head for a bare head and a helmeted head, starting from rest. At time  $t = 7.0$  ms, what is the difference in the speed acquired by the bare head and the speed acquired by the helmeted head?

