Chapter # 2 (Motion along a strait line)
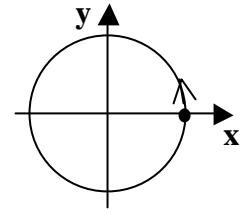
Q1 A particle moves with a constant speed along the circumference of a circle of radius 5 m. It completes one revolution every 20 s. What is the magnitude of its average velocity during the first 5 s? Assume that at t = 0, the particle is on +x-axis see figure 1).[sqrt(2) m/s]

Q2 The Figure represents the straight-line motion of a car. What is the distance traveled by the car from t = 0 to t = 5 h?
A. 480 km
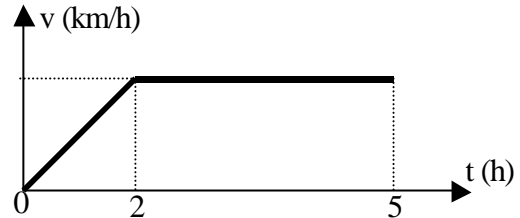
Q3 A particle moves along the x-axis according to the equation: **x = 50*t + 10*t**2**
where x is in m and t is in s. Calculate the instantaneous velocity of the particle at t = 3s.
A. 110 m/s

Q4 A baloon carrying a package is ascending (going vertically upward) at the rate of 12 m/s. When it is 80 m above the ground the package is released. How long does it take the package to reach the ground? [5.4 s]

Q5 The position of a particle moving along the x axis is described by the equation
$$x(t) = 5.0 + 2.0t + t**3$$
Find its average acceleration for the time interval t = 1.0 s to t = 2.0 s. [9.0 m/s**2]

Q6 A racing car traveling with constant acceleration increases its speed from 10 m/s to 30 m/s over a distance of 80 m? How long does this take? [4.0 s]

Q7 An object is thrown vertically upward at 35 m/s. Taking $g = 10$ m/s^2, the velocity of the object 5 seconds later is: [15 m/s down]

Q8 A stone is thrown vertically upward with an initial speed of 19.5 m/s. It will rise to a maximum height of: [19.4 m]

Q9 A stone is released from rest from the edge of a building 190 m above the ground. Neglecting air resistance, the speed of the stone, just before striking the ground, is: [61 m/s]

Q10 A projectile is shot vertically upward with a given initial velocity. It reaches a maximum height of 100 m. If, on a second shot, the initial velocity is doubled then the projectile will reach a maximum height of: [400 m]

Q11 An object is released from rest at a height H. It takes 2.00 s for the object to fall from point A to point B (see the Figure). What is the initial height H? [385 m]