# Kinematics : Test-30

1) A train travels with a velocity of 74 m/s. Find the time required to travel 410 km. _____ .

2) A race car accelerates from rest at 4.8 m/s^2.

    a) The velocity at t = 5.8 s is _____ .

    b) The distance traveled in the first 5.8 s is _____ .

3) A ball is dropped from the top of a 50. m high building.

    a) The velocity at t = 2.3 s is _____ .

    b) The time the ball hits the ground is: _____ .

4) A projectile is fired straight upward with a velocity of 85 m/s.

    a) The velocity at time t = 5.0 s. _____ .

    b) The velocity at time t = 10.0 s is _____ .

    c) The time the projectile reaches the maximum height is ___ .

    d) The maximum height is _____ .

    e) The acceleration of the projectile at the maximum height is _____ .

5) A ball that is initially at rest, rolls d = 2.3 m down the incline. The acceleration is 1.5 m/s^2 [down incline].
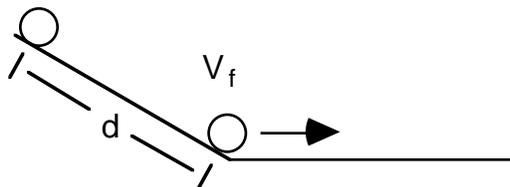
    a) Find the final velocity. _____ .

b) Find the time it takes for the ball to travel the distance d.
_____ .

6) Answer the following questions about the projectile. The initial time is 0.0 s. The initial displacement is [0.0,0.0]m.
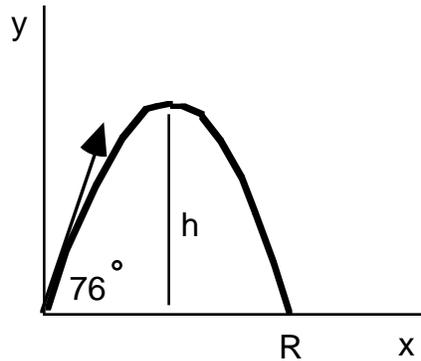
a) The initial speed is 350 m/s. Find the time that it takes to reach the maximum height. _____ .

b) Find the maximum height. _____ .

c) Find the range R. _____ .

d) Find the velocity at point R. Write as an ordered pair.
[,   ]m/s.

e) Find the displacement at time t = 45 s. Write as an ordered pair. [,   ]m.

7) A boy throws a dart with a speed of 14 m/s at an angle of 60.° to the horizontal. The dart hits a wall which is 12 m away. Assume that the initial displacement of the dart is [0.0, 2.0] m. (It is thrown from a height of 2.0 m) Find the height above the floor where the dart hits the wall.
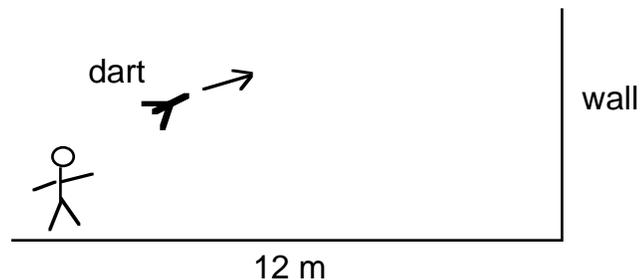
Answers: 1) 5.5×10^3 s, 2)a) 28 m/s, b) 81 m, 3)a) -23 m/s, b) 3.2 s, 4)a) 36 m/s, b) -13 m/s, c) 8.7 s, d) 370 m, e) -9.8 m/s^2, 5)a) 2.6 m/s [right], b) 1.8 s, 6)a) 35 s, b) 5.9×10^3 m, c) 5.9×10^3 m, d) [85, -340] m/s, e) [3800, 5400] m, 7) 8.4 m.