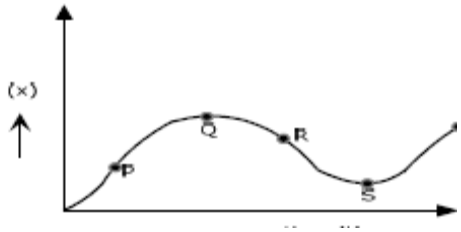
Class XI

Kinematics worksheet 3

1. Under what condition the displacement and the distance of a moving object will have the same magnitude? 1
2. What is the shape of the displacement time graph for uniform linear motion? 1
3. Figure shows a displacements time graph. Comment on the sign of velocities at point P, Q, R, S. 1



4. Draw displacement time graph for a uniformly accelerated motion? What is its shape? 2
5. The displacement x of a particle moving in one dimension under the action of constant force is related to the time by the equation $t = \sqrt{x} - 3$ where x is in meters and t is in seconds. Find the velocity of the particle at (1) t = 3s (2) t = 6s. 2
6. A balloon is ascending at the rate of 4.9m/s. A pocket is dropped from the balloon when situated at a height of 245m. How long does it take the packet to reach the ground? What is its final velocity? 2
7. A car moving on a straight highway with speed of 126km/hr. is brought to stop within a distance of 200m. What is the retardation of the car and how long does it take for the car to stop? 3
8. Derive (i) $v = u + at$ (ii) $v^2 - u^2 = 2as$ by calculus method 3

Class XI

Kinematics worksheet 4

1. What is "Trajectory of a projectile? 1
2. A projectile is fired at an angle of 30^o with the horizontal with velocity 10m/s. At what angle with the vertical should it be fired to get maximum range? 1
3. What is the value of angular speed for 1 revolution 1
4. What is the angle between two forces of 2N and 3N having resultant as 4N? 2
5. What is the angle of projection at which horizontal range and maximum height are equal? 2
6. Prove that for elevations which exceed or fall short of 45^o by equal amounts the ranges are equal? 2
7. Derive expressions for velocity and acceleration for uniform circular motion. 3
8. Derive an equation for the path of a projectile fired parallel to horizontal. 2
9. (a) Define time of flight and horizontal range? 2
   (b) From a certain height above the ground a stone A is dropped gently. Simultaneously another stone B is fired horizontally. Which of the two stones will arrive on the ground earlier?