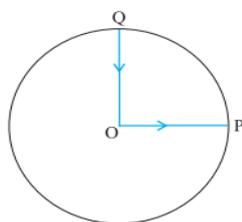


REVISION WORKSHEET-2018-19**CLASS-XI****SUBJECT-PHYSICS****UNIT- KINEMATICS****MOTION IN STRAIGHT LINE & MOTION IN PLANE**

- Two railway tracks are parallel to west-east direction. Along one track, train A moves with a speed of 30 m/s from west to east, while along the second track, train B moves with a speed of 48m/s from east to west. Calculate (i) relative speed of B w.r.t. A and (ii) relative speed of ground w.r.t. B. [-78m/s, 48m/s]
- On a foggy day, two car drivers spot each other, when they are just 80m apart. They are travelling at 72 km/h and 60 km/h respectively. Both of them simultaneously apply brakes, which retard both the cars at a rate 5m/s. determine whether they avert the collision or not. [67.78m]
- A body covers 4 m in 3rd second and 12 m in 5th second. If the motion is uniformly accelerated, how far will it travel in the next three seconds? [60 m]
- The displacement (in m) of a particle, moving along X-axis is given by $x = 18t + 5t^2$. Calculate (i) the average velocity between $t = 2s$ and $t = 3s$ and (iii) instantaneous acceleration.
- A balloon is ascending at the rate of 14 m/s at a height of 98m above the ground, when a packet is dropped from the balloon after how much time and with what velocity, does it reach the ground? [6.12s, 45.98 m]
- A ball is allowed to fall from the top of a tower 200 m high. At the same instant, another ball is thrown vertically upwards from the bottom of the tower with a velocity of 40 m/s. when and where the two balls meet? [5 s, 77.5 m]
- Which of the two - velocity or acceleration decides the direction of motion of a body? Explain, with the help of an example.
- The v-t graphs of two objects make angles of 30° and 60° with the time axis. Find the ratio of their acceleration.
- Can a body be at rest as well as in motion at the same time? Explain.
- Draw the position time graphs for uniform motion of two objects initially occupying different positions, but having zero relative velocity.
- For a particle in one dimensional motion, the instantaneous speed is always equal to the magnitude of instantaneous velocity. Why?
- If the displacement of a body is proportional to square of time, state whether the body is moving with uniform velocity or uniform acceleration.
- An aeroplane takes off at an angle of 30° to the horizontal. If the component of its velocity along the horizontal is 250km/h, what is its velocity? Also find the vertical component of its velocity. [288.68 km/h, 144.34 km/h]
- Find the angle of projection at which the horizontal range and maximum height of a projectile are equal. [75.96°]

15. A wheel is 0.6 m in radius is moving with a speed of 10 m/s. Find the angular speed.
[16.67 rad/s]
16. The ceiling of a long hall is 25 m high. What is the maximum horizontal distance that a ball thrown with a speed of 40 m s⁻¹ can go without hitting the ceiling of the hall?
[150.5m]
17. A cricketer can throw a ball to a maximum horizontal distance of 100 m. How much high above the ground can the cricketer throw the same ball?
[50 m]
18. A stone tied to the end of a string 80 cm long is whirled in a horizontal circle with a constant speed. If the stone makes 14 revolutions in 25 s, what is the magnitude and direction of acceleration of the stone?
[990.4 cm/s²]
19. An aircraft executes a horizontal loop of radius 1.00 km with a steady speed of 900 km/h. Compare its centripetal acceleration with the acceleration due to gravity.
[6.38g]
20. Can you associate vectors with
(a) the length of a wire bent into a loop,
(b) a plane area,
(c) a sphere ? Explain.
21. A bullet fired at an angle of 30° with the horizontal hits the ground 3.0 km away. By adjusting its angle of projection, can one hope to hit a target 5.0 km away? Assume the muzzle speed to be fixed, and neglect air resistance.
[1.44]
22. A cyclist starts from the centre O of a circular park of radius 1 km, reaches the edge P of the park, then cycles along the circumference, and returns to the centre along QO as shown in Fig. 4.21. If the round trip takes 10 min, what is the (a) net displacement, (b) average velocity, and (c) average speed of the cyclist?



23. Derive an expression for the acceleration of a body moving uniformly on a circular path.
24. What is projectile motion? Obtain an expression for maximum height, range, time of flight, and trajectory, when it is fired at an angle θ .
25. It is easier to pull a lawn roller than to push it. Why?
26. Define angular acceleration. Establish its relation with linear acceleration.
27. Define angular velocity. Establish its relation with linear velocity.
28. A projectile is projected horizontally from the top of a tower with uniform velocity u . show that its path will be parabolic.
29. Derive equations of motion. (graphical and analytical method)
30. Establish a relation between linear displacement and angular displacement.

Practice other derivations and learn definitions.

Solve the above questions I register in the given order only.
