# FREEDOM INTERNATIONAL SCHOOL

## WORKSHEET- MCQ

## PHYSICS

## CLASS XI

## MOTION IN A PLANE

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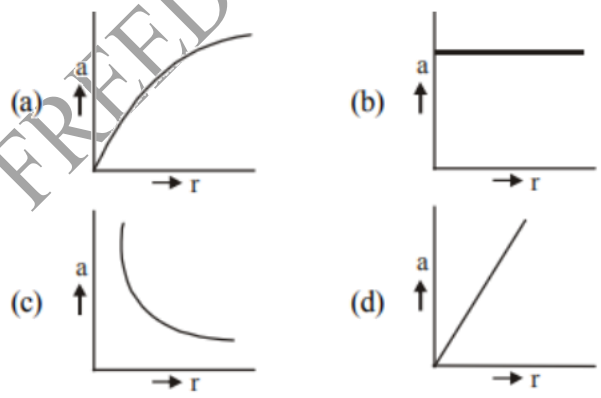
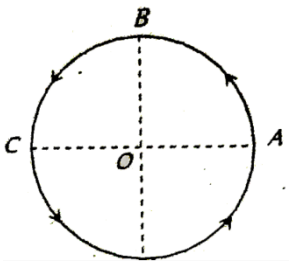
1. The square of resultant of two equal forces is three times their product. Angle between the forces is
   (a) $\pi$ (b) $\frac{\pi}{2}$ (c) $\frac{\pi}{4}$ (d) $\frac{\pi}{3}$
2. A bird flies from (-3m, 4m, -3m) to (7 m, -2 m, -3 m) in the xyz coordinates. The bird's displacement in unit vectors is given by
   (a) $(4\hat{\imath} + 2\hat{\jmath} - 6\hat{k})$ (b) $(10\hat{\imath} - 6\hat{\jmath})$ (c) $(4\hat{\imath} - 2\hat{\jmath})$ (d) $(10\,\hat{\imath} + 6\hat{\jmath} - 6\hat{k})$
3. The angle between the two vectors $\vec{A} = (5\hat{\imath} + 5\hat{\jmath})$ and $\vec{B} = (5\hat{\imath} - 5\hat{\jmath})$ will be
   (a) zero (b) 90° (c) 45° (d) 0°
4. A cyclist moves in such a way that he takes 60° turn after every 100 metres. What is the displacement when he takes the seventh turn?
   (a) 100 m (b) 200 m (c) $100\sqrt{3}$ m (d) $100/\sqrt{3}$ m
5. Which of the following is true regarding projectile motion?
   (a) horizontal velocity of projectile is constant (b) vertical velocity of projectile is constant
   (c) acceleration is not constant (d) momentum is constant
6. A bomb is fired from a canon with a velocity of 1000 m/s making an angle of 30° with the horizontal (g= 9.8 m/s$^2$). Time taken by the bomb to reach the highest point is
   (a) 40 s (b) 30 s (c) 51 s (d) 25 s
7. If a cycle wheel of radius 4 m completes one revolution in two seconds, then the acceleration of the cycle is
   (a) $\pi$ m/s$^2$ (b) $2\pi^2$ m/s$^2$ (c) $\pi^2$ m/s$^2$ (d) $4\pi^2$ m/s$^2$
8. If a body moving in a circular path maintains constant speed of 10 m/s, then which of the following correctly describes relation between acceleration and radius?




9. $\vec{A}$ and $\vec{B}$ are two vectors and θ is the angle between them, if $|\vec{A} \times \vec{B}| = \sqrt{3}\,(\vec{A}.\vec{B})$, the value of θ is
   (a) 45° (b) 30° (c) 90° (d) 60°

10. The figure shows a body of mass m moving with a uniform speed v along a circle of radius r. The change in velocity in going from A to B is




(a) v $\sqrt{2}$ (b) v/$\sqrt{2}$

(c) v (d) zero

**For questions 11 to 15, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the options as given below.**

**A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion.**
**B. Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.**
**C. Assertion is true but Reason is false.**
**D. Both Assertion and Reason are false.**

11. **Assertion:** For a projectile the time of flight of a body becomes n times the original value if its speed is made n times.
**Reason:** This is due to the range of the projectile which becomes n times.
12. **Assertion:** Magnitude of the resultant of two vectors may be less than the magnitude of either vector.
**Reason:** The resultant of two vectors is obtained by means of law of parallelogram of vectors.
13. **Assertion:** If $\hat{\imath}$ and $\hat{\jmath}$ are unit vectors along x-axis and y-axis respectively, the magnitude of vector $\hat{\imath} + \hat{\jmath}$ will be $\sqrt{2}$.
**Reason:** Unit vectors are used to indicate a direction only.
14. **Assertion:** Two particles of different masses are projected with same velocity at the same angles. The maximum height attained by both the particles will be same.
**Reason**: The maximum height of the projectile is independent of particle mass.
15. **Assertion:** If dot product and cross product $\vec{A}$ and $\vec{B}$ are zero, it implies that one of the vectors $\vec{A}$ or $\vec{B}$ must be a null vector.
**Reason:** Null vector is a vector with zero magnitude.