



INDIAN SCHOOL NIZWA - WORKSHEET

PHYSICS

CH: 4 MOTION IN A PLANE

Name: _____

Date: _____

Class: XI Sec: A

1.	The relation between vector A and $-2A$ is that (a) both have same magnitude (b) both have same direction (c) they have opposite directions (d) None of the above
2.	A and B are two inclined vectors. R is their sum. Choose the correct figure for the description: <p>(a) (b) (c) (d) </p>
3.	Forces F_1 and F_2 act on a point mass in two mutually perpendicular directions. The resultant force on the point mass will be (a) $F_1 + F_2$ (b) $F_1 - F_2$ (c) $\sqrt{F_1^2 + F_2^2}$ (d) $F_1^2 + F_2^2$
4.	Three vectors P , Q and R satisfy the relation $P \cdot Q = 0$ and $P \cdot R = 0$. The vector P is parallel to (A) Q (B) R (C) $Q \times R$ (D) $Q \cdot R$
	ASSERTION & REASON QUESTIONS: Directions: Each of these questions contains two statements, Assertion and Reason. Each of these



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questions also has four Alternative choices, only one of which is the correct answer. You have to

select one of the codes (a), (b), (c) and (d) given below.

(a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.

(b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion

(c) Assertion is correct, reason is incorrect

(d) Assertion is incorrect, reason is correct.

5. **ASSERTION:** A physical quantity cannot be called as a vector if its magnitude is zero.
REASON: A vector has both magnitude and direction.

6. **ASSERTION:** If dot product and cross product of \vec{A} and \vec{B} are zero, it implies that one of the vector \vec{A} and \vec{B} must be a null vector.
REASON: Null vector is a vector with zero magnitude.

7.

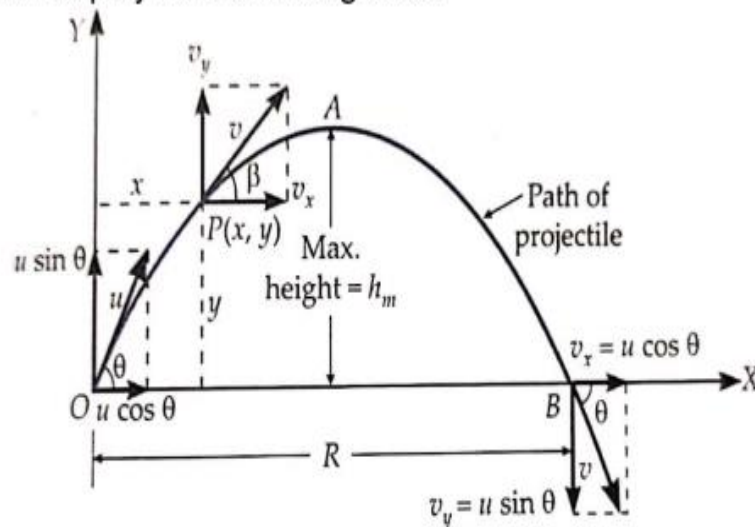
(BALLISTIC PROJECTION)PROJECTILE MOTION

Projectile fired at an angle θ with the horizontal as shown in Fig. suppose a body is projected with initial velocity u , making an angle θ with the horizontal. The velocity u has two rectangular components:

(i) The horizontal component $u \cos\theta$, which remains constant throughout the motion.

(ii) The vertical component $u \sin\theta$, which changes with time under the effect of gravity.

This component first decreases, becomes zero at the highest point A, after which it again increases, till the projectile hits the ground.





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(i). The time of flight is :

- (A) $\frac{u \sin \theta}{2g}$
(B) $\frac{2u \sin \theta}{g}$
(C) $\frac{u \sin \theta}{g}$
(D) $\frac{u \sin \theta}{4g}$

(ii). Maximum Height attained by the projectile is :

- (A) $H = 2u^2 \sin^2 \theta / g$
(B) $H = u^2 \sin^2 \theta / 2g$
(C) $H = 4u^2 \sin^2 \theta / g$
(D) $H = u^2 \sin^2 \theta / 4g$

(iii). Horizontal range is :

- (A) $R = u^2 \sin 2\theta / g$
(B) $R = u^2 \sin 2\theta / 4g$
(C) $R = 2u^2 \sin 2\theta / g$
(D) $R = u^2 \sin \theta / 4g$

(iv). The Maximum horizontal range is :

- (A) $R_{\max} = u^2 / g$
(B) $R_{\max} = u^2 / 2g$
(C) $R_{\max} = u^2 / 3g$
(D) $R_{\max} = u^2 / 4g$

(v). For which pairs of angle of projection the horizontal range will be same?

- (A) $45^\circ, 50^\circ$
(B) $35^\circ, 55^\circ$
(C) $50^\circ, 60^\circ$
(D) $80^\circ, 60^\circ$

8. What should be the angle θ between two vectors A and B for their resultant R to be
(i) maximum (ii) minimum
9. The angle between two vectors of equal magnitude is 120° . Prove that the magnitude of their resultant is equal to either of them.
10. Two forces of 30N and 40N are inclined to each other by 60° . Find their resultant. What will be the angle if the forces are inclined at right angles to each other?
11. The resultant of two equal forces acting at right angles to each other is 1414N. Find the magnitude of each force.
12. When is the magnitude of the resultant of two vectors equal to either of them?
13. A particle has a displacement of 12 m towards east and 5m towards north and then 6m vertically upward. Find the magnitude of the resultant displacement.



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14.	What is the dot product of two perpendicular vectors A and B ?
15.	Two vectors are given as $A = (3i + 9j - 6k)$ and $B = (8i + 4j + 8k)$. Find $A + B$
16.	What is the magnitude of the vector $2i - 3j + \sqrt{3}k$?
17.	Given $A = (2i + 3j + 4k)$ and $B = (3i - 4j + k)$. Find the angle between A and B .
18.	A river 1km wide is flowing at 3km/h. A swimmer whose velocity in still water is 4Km/h can swim only for 15 minutes. In what direction should he strike out in order to reach the other bank? What is the total distance covered?
19.	The position vector of a particle at $t = 0$ is $r_1 = -3i + 2j$ and the later at $t = t$, it is $r_2 = 9i + 2j$. What is the displacement?
20.	A ball is thrown with a speed of 17m/s at a projection angle of 58° above the horizontal. Determine (i) the time of maximum height (ii) the maximum height above the release point.
21.	A grass hopper can jump a maximum horizontal distance of 1m. If it spends minimum time on the ground, what is the speed of travel along the road?
22.	A man can jump on the moon six times as high as on the earth. Why?