

MOTION (1 D & 2 D) WORKSHEET - 3

Q1) A hill is 500 m high. Supplies are to be sent across the hill using a canon that can hurl packets at a speed of 125 m/s over the hill. The canon is located at a distance of 800m from the foot of hill and can be moved on the ground at a speed of 2 m/s; so that its distance from the hill can be adjusted. What is the shortest time in which a packet can reach on the ground across the hill? Take $g = 10 \text{ m/s}^2$.



Sol:

$$u_y = \sqrt{2gh} \geq \text{ } \text{m/s}$$

$$u = 125 \text{ m/s}$$

$$\text{then } u_x = \text{ } \text{m/s}$$

$$\text{time taken by the packet to reach the top of the hill, } t = \text{ } \text{s}$$

$$\text{time taken to reach the ground on the other side of the hill is } \text{ } \text{s}$$

$$\text{horizontal distance travelled during entire flight is } \text{ } \text{m.}$$

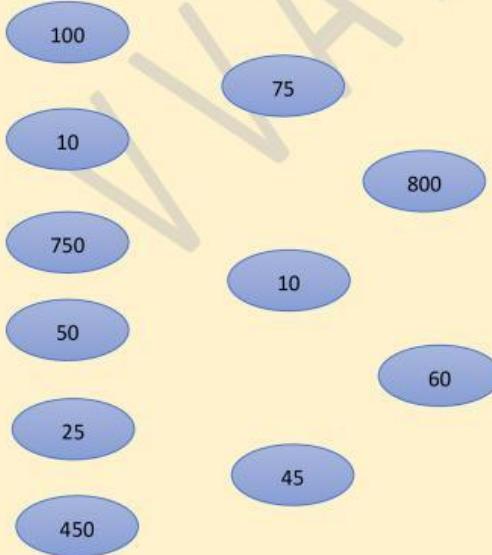
$$\text{so the distance between canon and hill is } \text{ } \text{m}$$

$$\text{the distance for which canon needs to move before hurl packets } \text{ } \text{m}$$

$$\text{time taken for the canon to move on ground } \text{ } \text{s}$$

$$\text{so the total time taken by the packet } \text{ } \text{s}$$

Drag and Drop:



Q2) If $|\vec{A}| = 2$ and $|\vec{B}| = 4$, then match the relations in column I with the angle θ between A and B in column II.

Column I

$$\vec{A} \cdot \vec{B} = 0$$



$$\vec{A} \cdot \vec{B} = 8$$



$$\vec{A} \cdot \vec{B} = 4$$



$$\vec{A} \cdot \vec{B} = -8$$



Column II

$$\theta = 0^\circ$$



$$\theta = 90^\circ$$



$$\theta = 180^\circ$$



$$\theta = 60^\circ$$



Q3) Q2) If $|\vec{A}| = 2$ and $|\vec{B}| = 4$, then match the relations in column I with the angle θ between A and B in column II.

Column I

$$\vec{A} \times \vec{B} = 0$$



$$\vec{A} \times \vec{B} = 8$$



$$\vec{A} \times \vec{B} = 4$$



$$\vec{A} \times \vec{B} = 4\sqrt{2}$$



Column II

$$\theta = 30^\circ$$



$$\theta = 45^\circ$$



$$\theta = 0^\circ$$



$$\theta = 90^\circ$$



References : NCERT