

2 (a) Define displacement from a point.

.....
..... [1]

(b) An object is projected horizontally at a speed of 6.0 m s^{-1} from a slope, as shown in Fig. 2.1.

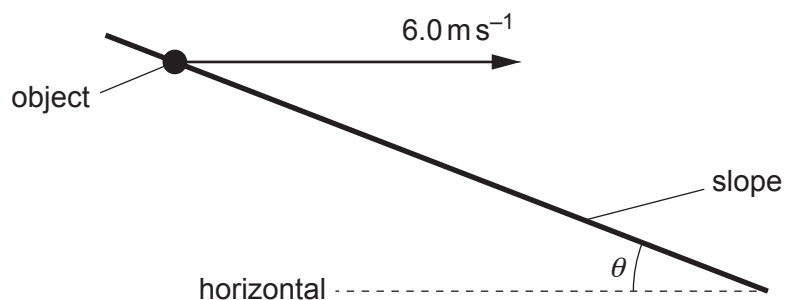


Fig. 2.1 (not to scale)

The slope is at an angle θ to the horizontal. Air resistance is negligible.

The object lands on the slope a time of 0.71 s later and stops without rolling or bouncing.

(i) Determine the horizontal distance travelled by the object.

distance = m [1]

(ii) Determine the vertical distance travelled by the object.

distance = m [2]

(iii) Use your answers in (b)(i) and (b)(ii) to calculate θ .

$$\theta = \dots\dots\dots^\circ \quad [2]$$

(iv) Determine the magnitude of the displacement of the object from its original position.

$$\text{displacement} = \dots\dots\dots \text{ m} \quad [2]$$

(v) By considering energy, calculate the speed of the object just before it lands.

$$\text{speed} = \dots\dots\dots \text{ ms}^{-1} \quad [3]$$