

- 4 A trolley moves down a slope, as shown in Fig. 4.1.

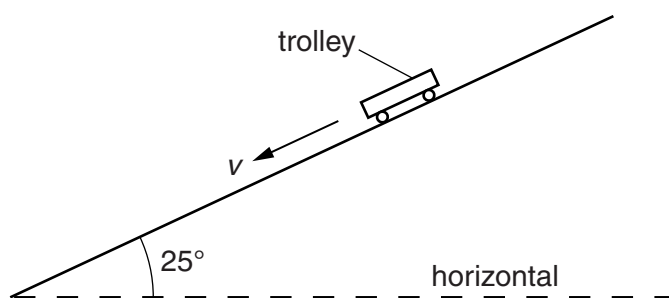


Fig. 4.1

The slope makes an angle of 25° with the horizontal. A constant resistive force F_R acts up the slope on the trolley.

At time $t = 0$, the trolley has velocity $v = 0.50 \text{ m s}^{-1}$ down the slope.

At time $t = 4.0 \text{ s}$, $v = 12 \text{ m s}^{-1}$ down the slope.

- (a) (i) Show that the acceleration of the trolley down the slope is approximately 3 m s^{-2} .

[2]

- (ii) Calculate the distance x moved by the trolley down the slope from time $t = 0$ to $t = 4.0 \text{ s}$.

$x = \dots\dots\dots \text{ m}$ [2]

- (iii) On Fig. 4.2, sketch the variation with time t of distance x moved by the trolley.

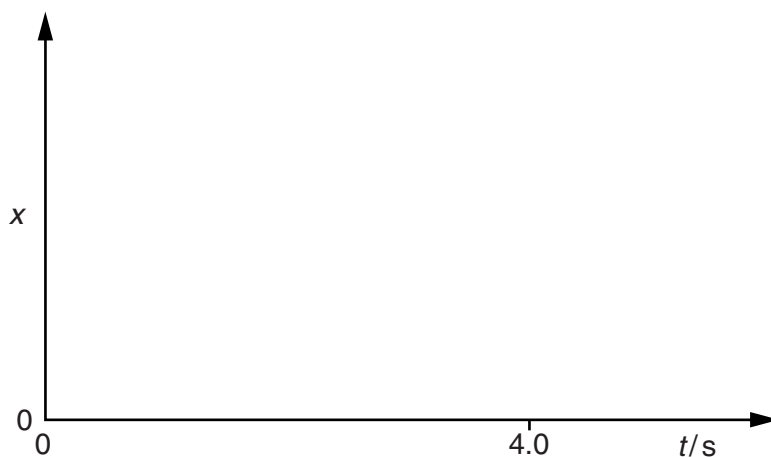


Fig. 4.2

[2]

(b) The mass of the trolley is 2.0 kg.

(i) Show that the component of the weight of the trolley down the slope is 8.3 N.

[1]

(ii) Calculate the resistive force F_R .

$F_R = \dots\dots\dots$ N [2]