

- 3 A block is pulled by a force X in a straight line along a rough horizontal surface, as shown in Fig. 3.1.

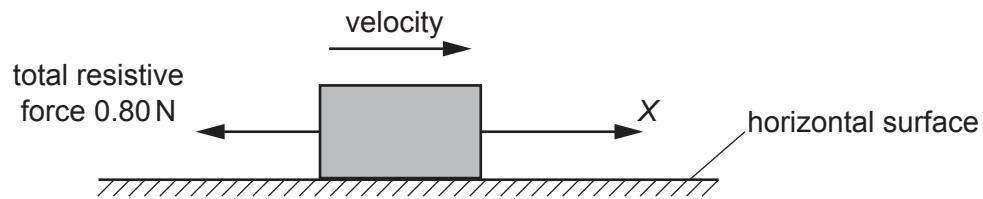


Fig. 3.1

Assume that the total resistive force opposing the motion of the block is 0.80 N at all speeds of the block.

The variation with time t of the magnitude of the force X is shown in Fig. 3.2.

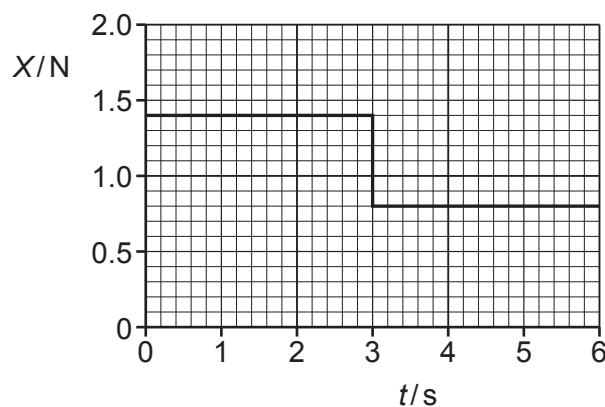


Fig. 3.2

- (a) (i) Define force.

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

- (ii) Determine the change in momentum of the block from time $t = 0$ to time $t = 3.0\text{ s}$.

change in momentum = kg m s^{-1} [2]

- (b) (i) Describe and explain the motion of the block between time $t = 3.0\text{ s}$ and time $t = 6.0\text{ s}$.

.....
.....
.....
..... [2]

- (ii) Force X produces a total power of 2.0 W when moving the block between time $t = 3.0\text{ s}$ and time $t = 6.0\text{ s}$.

Calculate the distance moved by the block during this time interval.

$$\text{distance} = \dots \text{m} \quad [3]$$

- (c) The block is at rest at time $t = 0$.

On Fig. 3.3, sketch a graph to show the variation of the momentum of the block with time t from $t = 0$ to $t = 6.0\text{ s}$.

Numerical values of momentum are not required.

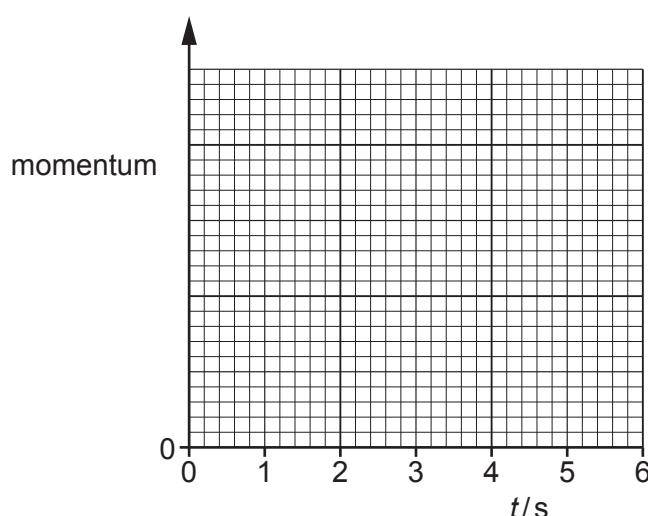


Fig. 3.3

[2]