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

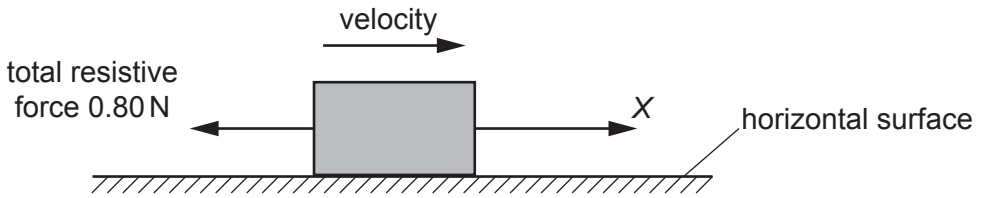

Fig. 3.1

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.

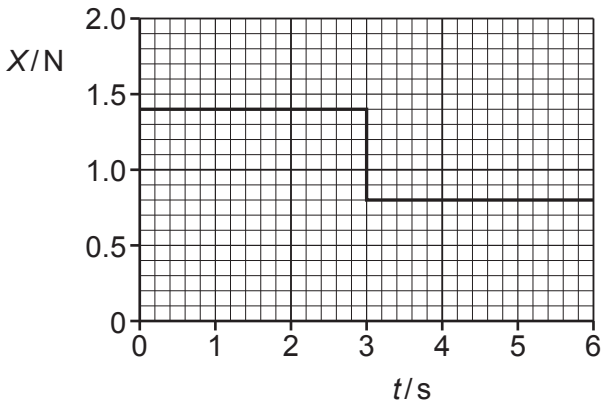

Fig. 3.2

(a) (i) Define force.

.....

..... [1]

(ii) Determine the change in momentum of the block from time t = 0 to time t = 3.0 s.

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

(b) **(i)** Describe and explain the motion of the block between time $t = 3.0\,s$ and time $t = 6.0\,s$.

.....

.....

.....

..... [2]

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

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

distance = ... m [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 $t = 6.0\,s$.
Numerical values of momentum are not required.

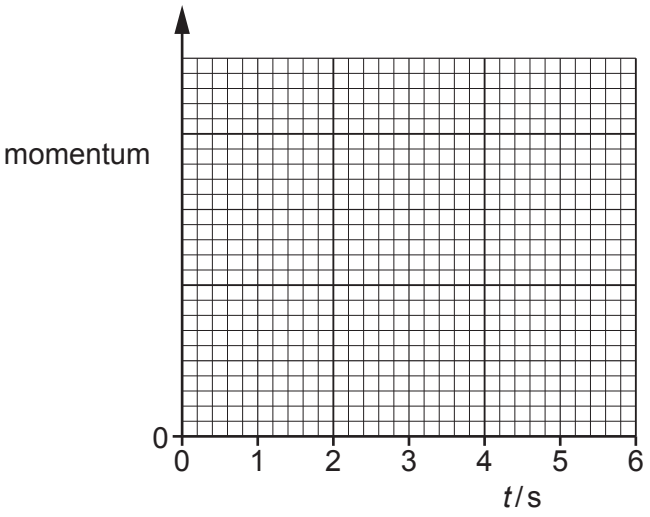

Fig. 3.3

[2]

[Total: 10]