2 An object of constant mass moves in a straight line. The variation with time t of the momentum p of the object is shown in Fig. 2.1.

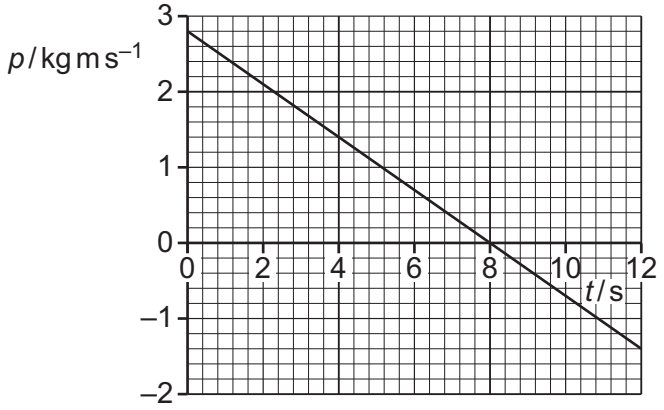

Fig. 2.1

(a) Define momentum.

.....

..... [1]

(b) Calculate the change in momentum of the object from time $t = 0$ to $t = 12$ s.

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

(c) Calculate the magnitude of the resultant force acting on the object.

force = ... N [2]

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(d) Describe the variation of the speed of the object from time $t = 0$ to $t = 8.0$ s.

.....

..... [1]

(e) By reference to Fig. 2.1, explain why the resultant force acting on the object during the first 8.0 s of its motion cannot be due to air resistance.

.....

.....

.....

..... [2]

(f) At time $t = 0$ the displacement d of the object is zero.

On Fig. 2.2, sketch the variation of d with time t from $t = 0$ to $t = 12$ s.

Numerical values of d are not required.

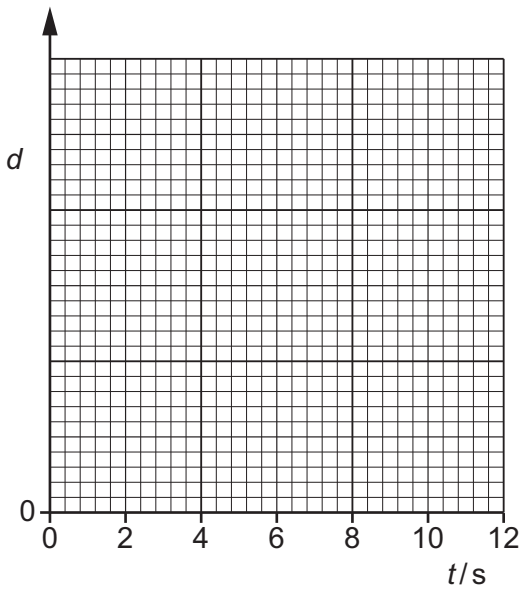

Fig. 2.2

[3]

[Total: 10]