2 **(a)** Define linear momentum.

.....

..... [1]

(b) A car of mass 1800 kg is moving in a straight line. Fig. 2.1 shows the variation with time t of the momentum p of the car.

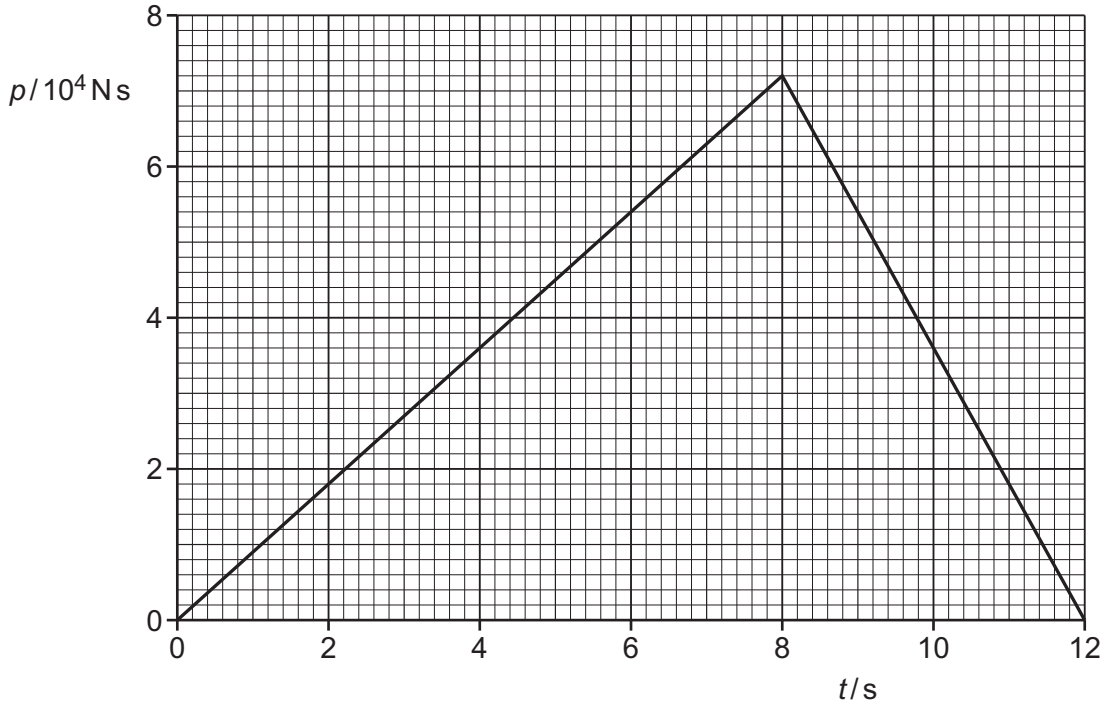

Fig. 2.1

(i) Calculate the maximum speed reached by the car.

maximum speed = ... $m\,s^{-1}$ [1]

(ii) Calculate the maximum kinetic energy of the car.

maximum kinetic energy = ... J [2]

(iii) Show that the acceleration of the car at time $t = 4.0\,s$ is $5.0\,m\,s^{-2}$.

[2]

(iv) Determine the distance travelled by the car between times $t = 0$ and $t = 12.0\,s$.

distance = ... m [2]

(c) On Fig. 2.2, sketch the variation with time t of the acceleration a of the car in **(b)** from $t = 0$ to $t = 12.0\,s$.

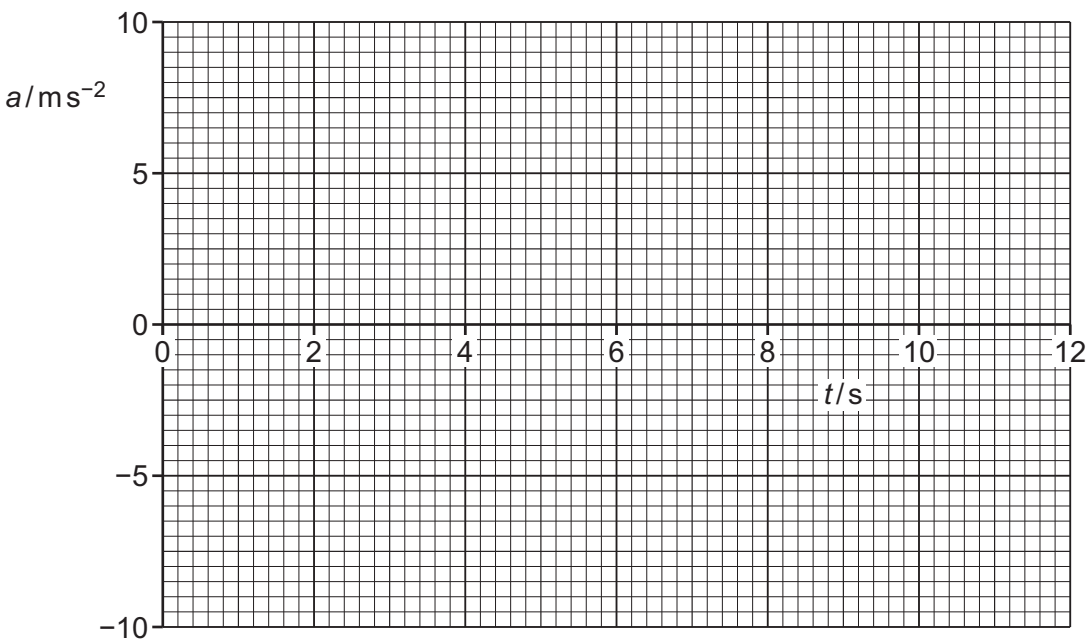

Fig. 2.2

[3]

[Total: 11]