

- 2 The variation with time  $t$  of the velocity  $v$  of two cars P and Q is shown in Fig. 2.1.

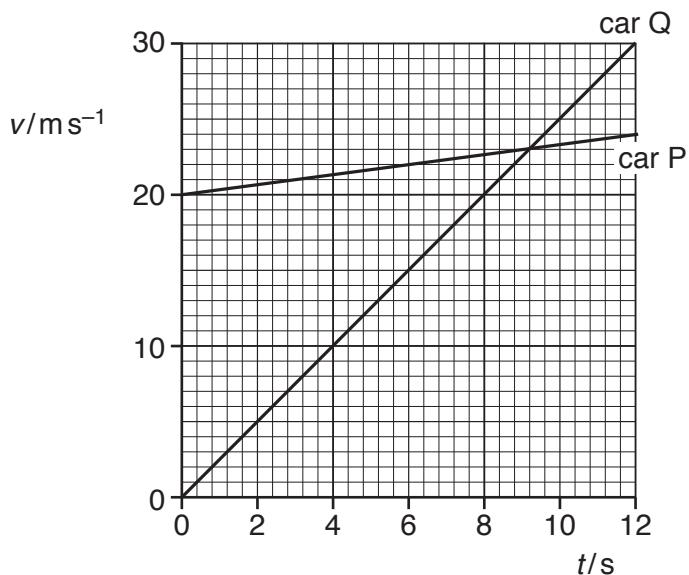


Fig. 2.1

The cars travel in the same direction along a straight road.  
Car P passes car Q at time  $t = 0$ .

- (a) The speed limit for cars on the road is  $100\text{ km h}^{-1}$ . State and explain whether car Q exceeds the speed limit.

..... [1]

- (b) Calculate the acceleration of car P.

acceleration = .....  $\text{m s}^{-2}$  [2]

- (c) Determine the distance between the two cars at time  $t = 12\text{ s}$ .

distance = ..... m [3]

- (d) From time  $t = 12\text{ s}$ , the velocity of each car remains constant at its value at  $t = 12\text{ s}$ .

Determine the time  $t$  at which car Q passes car P.

$t =$  ..... s [2]

[Total: 8]