decay constant $\lambda = \frac{\ln 2}{t_{1/2}}$

Answer **all** the questions in the space provided.

1 A car has a total mass of 1100 kg and an initial speed 18.0 m s^{-1}. A set of traffic lights turn red when the driver is some distance from them. The driver applies a braking force on the car. Fig. 1.1 is the graph of braking force against time for the car approaching the traffic lights.

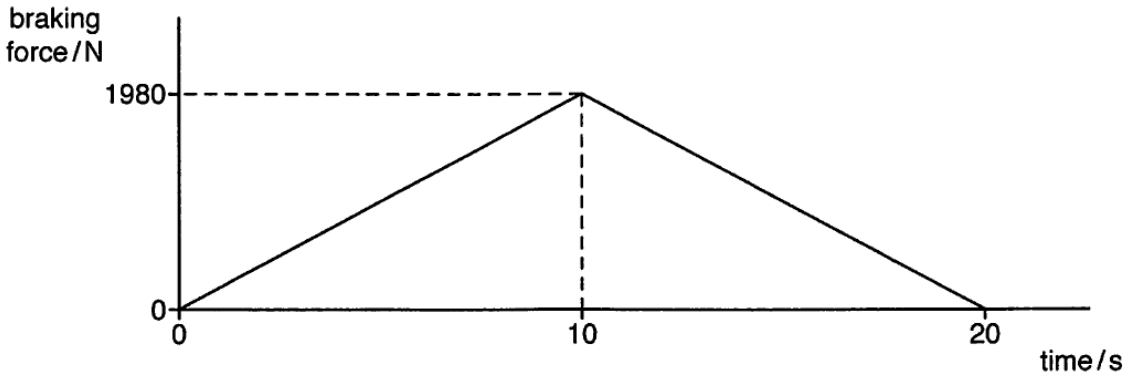

Fig. 1.1

(a) **(i)** Calculate the speed of the car at 10 s.

speed = …….. m s^{-1} [2]

(ii) State an assumption made in your calculations above.

……..……...……

…..…….……..…….. [1]

(b) On Fig. 1.2, sketch a graph to show how the speed of the car changes from the instant the braking force is applied till the force becomes zero. [3]

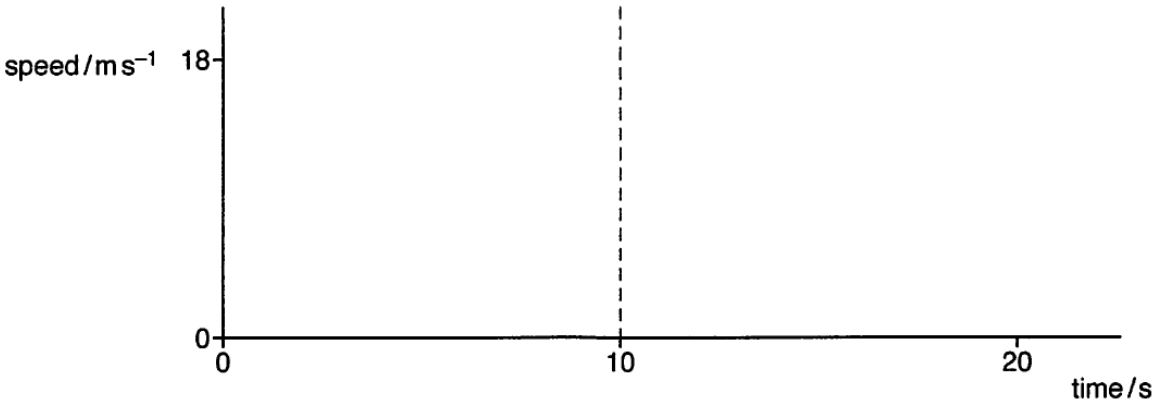

Fig. 1.2

(c) On Fig. 1.3, sketch a graph to show how the distance travelled by the car from the instant the braking force is applied till the force becomes zero. [2]

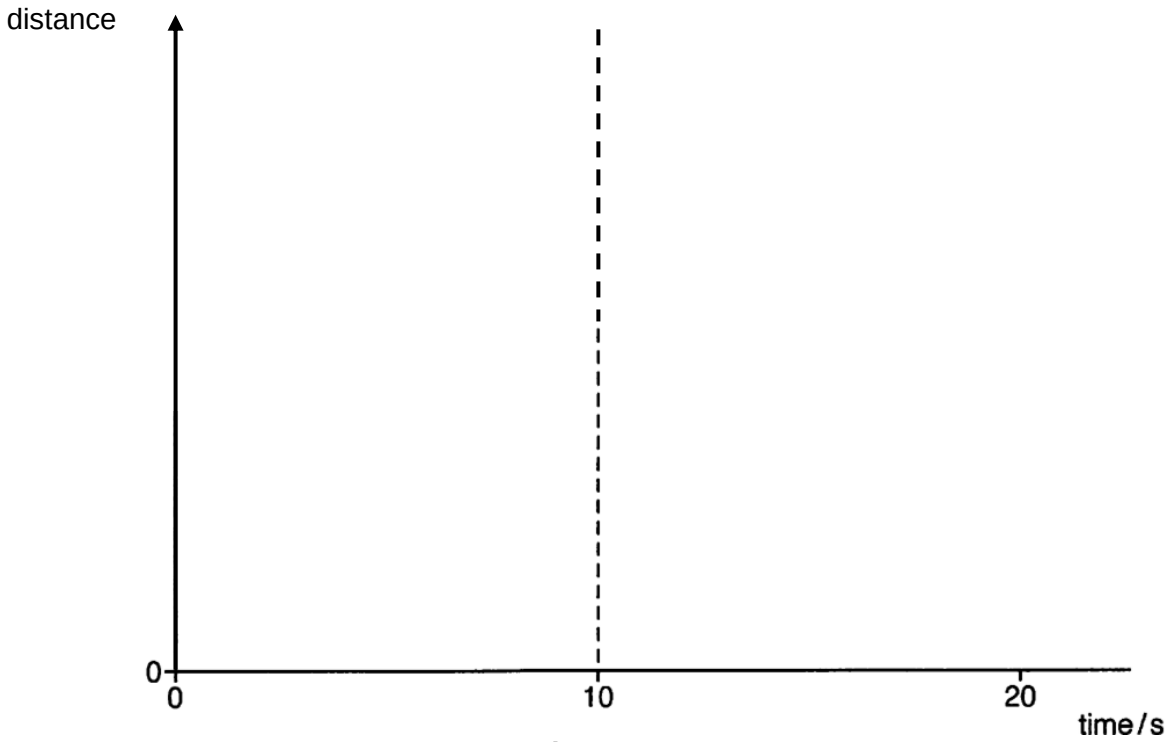

Fig 1.3