

- 5 (a) A car accelerates at a constant rate of  $1.83 \text{ m/s}^2$  along a flat straight road.

The force acting on the car is  $1.870 \text{ kN}$ .

Calculate the mass of the car.

Give your answer to three significant figures.

(3)

mass = ..... kg

- (b) The car accelerates from rest for  $16 \text{ s}$ .

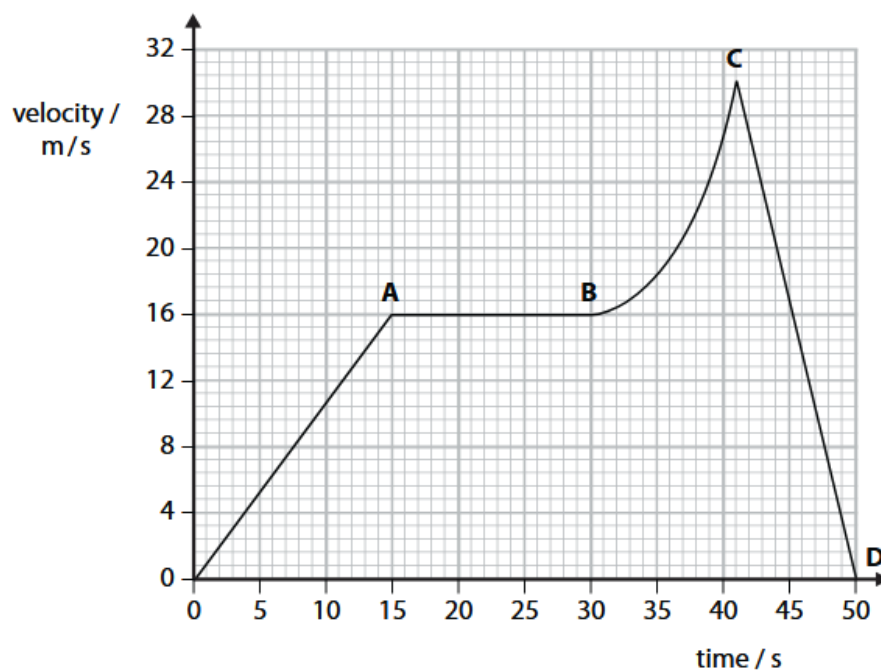
Calculate the speed of the car after  $16 \text{ s}$ .

(3)

speed = ..... m/s

(c) The car starts on another journey.

Figure 6 shows the graph of the car's movement.



**Figure 6**

Show that the distance travelled when the car is moving at a constant speed is greater than the distance travelled when the car is slowing down.

(4)

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(Total for Question 5 = 10 marks)

Question number	Answer	Additional guidance	Mark
5(a)	Rearrangement (1) $m = \frac{f}{a}$ Substitution and conversion (1) $m = \frac{1870}{1.83}$ Answer and rounding to 3 s.f. (1) 1020 (kg)	maximum 2 marks if kN not converted to N  award full marks for correct numerical answer without working	(3)

Question number	Answer	Additional guidance	Mark
5(b)	Rearrangement of $\frac{(v-u)}{t} = a$ (1) $v = u + at$ Substitution (1) $v = 0 + 1.83 \times 16$ Answer (1) 29.3 (m/s)	award full marks for correct numerical answer without working	(3)

Question number	Answer	Mark
5(c)	Correctly identifies data points from the graph to calculate areas (1)  Calculates area under AB (1) 240 m  Calculates area under CD (1) 135 m  distance travelled at constant speed = 240 m is greater than distance travelled when slowing down = 135 m (1)	(4)

