

**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 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 s.

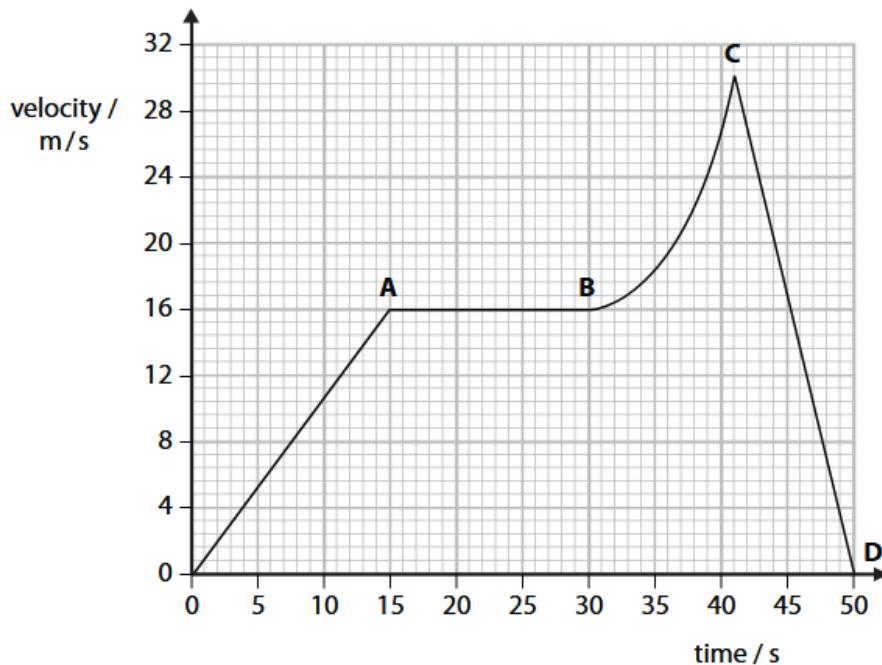
Calculate the speed of the car after 16 s.

(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)

---

(Total for Question 5 = 10 marks)

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

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

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

