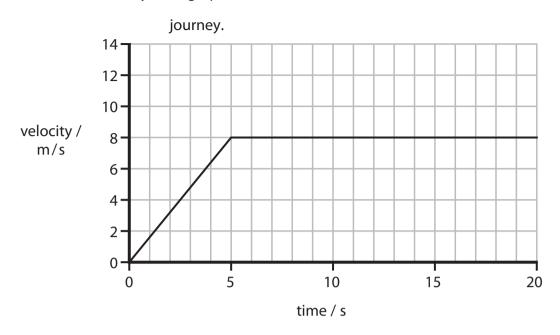
## **Forces and motion**

1 (a) Here is the velocity-time graph for a car for the first 20 s of a



(i) Calculate the change in velocity of the car during the first  $5\ s.$ 

(1)

change in velocity = ..... m/s

(ii) Calculate the acceleration of the car during the first 5 s.

(2)

acceleration = ..... m/s<sup>2</sup>

(iii) State the size of the resultant force between 10 s and 15 s

(1)

resultant force = ......N

(b)	The mass of a car is 1200 kg.	
	Calculate the resultant force on the car required to produce an acceleration of 0.8 m/s <sup>2</sup> .	
		(2)
	resultant force =	N
*(c)	A car, travelling at 20 m/s, with just the driver inside takes 70 m to stop in an	
	emergency. The same car is then fully loaded with luggage and passengers as well as the driver.	
	Explain why it will take a different distance to stop in an emergency from the	
	same speed.	(6)

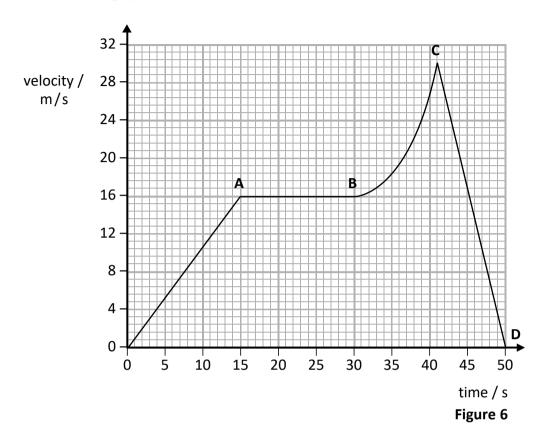
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(Total for Question = 12 marks)

The force acting on the car is 1.870 kN.  Calculate the mass of the car.  Give your answer to three significant figures.  mass =  (b) The car accelerates from rest for 16 s.  Calculate the speed of the car after 16 s.  speed =	2	(a)	) A car accelerates at a constant rate of 1.83 m/s <sup>2</sup> along a flat straight road.				
Give your answer to three significant figures.  mass =  (b) The car accelerates from rest for 16 s.  Calculate the speed of the car after 16 s.			The force acting on the car is 1.870 kN.				
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(c) The car starts on another journey.

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



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)