

- 2 (a) Explain what is meant by *work done*.

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..... [1]

- (b) A car is travelling along a road that has a uniform downhill gradient, as shown in Fig. 2.1.

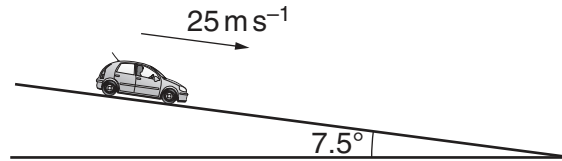


Fig. 2.1

The car has a total mass of 850 kg. The angle of the road to the horizontal is 7.5° .

Calculate the component of the weight of the car down the slope.

component of weight = N [2]

- (c) The car in (b) is travelling at a constant speed of 25 m s^{-1} . The driver then applies the brakes to stop the car. The constant force resisting the motion of the car is 4600 N.

- (i) Show that the deceleration of the car with the brakes applied is 4.1 m s^{-2} .

[2]

- (ii) Calculate the distance the car travels from when the brakes are applied until the car comes to rest.

distance = m [2]

(iii) Calculate

1. the loss of kinetic energy of the car,

loss of kinetic energy = J [2]

2. the work done by the resisting force of 4600 N.

work done = J [1]

(iv) The quantities in **(iii) part 1** and in **(iii) part 2** are not equal. Explain why these two quantities are not equal.

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..... [1]