

- 1 (a) State Newton's second law of motion.

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[1]

- (b) A car of mass 750 kg is travelling at 25 ms^{-1} along a horizontal road. The brakes are applied and the car is brought to rest by an average resistive force F . The car has an average deceleration of 4.8 ms^{-2} .

- (i) Show that the resistive force acting on the car is 3600 N.

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[1]

- (ii) Calculate the distance travelled by the car during this deceleration.

distance = m [2]

- (iii) Describe, in terms of Newton's third law, the horizontal forces acting on the tyres of the car and on the road.

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[2]

- (c) The car in (b) now travels at 25 ms^{-1} down a slope where the angle to the horizontal is 10° . The car is brought to rest by applying the brakes. The same resistive force of 3600 N acts on the car.

- (i) Explain why the distance the car travels before coming to rest is greater than in (b).

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[1]

- (ii) Calculate the deceleration of the car.

deceleration = ms^{-2} [2]