

Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

5 Newton's laws of motion

Exercise B, Question 9

Question:

A car of mass 1 tonne travels along a horizontal road and brakes from 50 m s^{-1} to rest in a distance of 300 m. Find the braking force on the car.

Solution:

$$v^2 = u^2 + 2as$$

$$0^2 = 50^2 + 2(-r)(300)$$

$$\therefore 600r = 2500$$

$$r = \frac{2500}{600}$$

$$r = 4\frac{1}{6} \text{ m s}^{-2}$$

Newton's 2nd Law, \leftarrow

$$\text{Braking force} = 1000 \times 4\frac{1}{6}$$

$$= 4166\frac{2}{3} \text{ N}$$

$$= 4170 \text{ N (3 s.f.)}$$

