

Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

5 Newton's laws of motion

Exercise A, Question 4

Question:

A small object is being pulled across a horizontal surface at a constant velocity by a force of 12 N acting parallel to the surface. If the mass of the object is 5 kg, determine the coefficient of friction between the object and the surface.

Solution:

$$\text{Newton 1, } \uparrow R - 49 = 0$$

$$\therefore R = 49 \text{ N}$$

$$\text{Newton 1, } \rightarrow 12 - F = 0$$

$$\therefore F = 12 \text{ N}$$

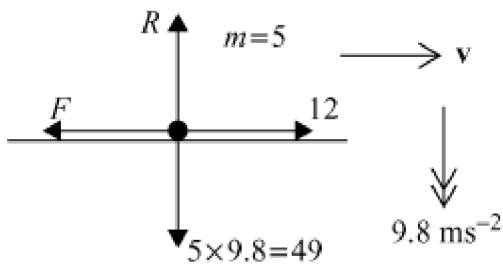
$$\text{Limiting friction } F = \mu R$$

$$\therefore 12 = \mu \times 49.89\dots$$

$$\therefore \mu = \frac{12}{49}$$

$$\mu = 0.24489\dots$$

$$\mu = 0.245 \text{ (3 s.f.)}$$



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