

Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

4 Forces

Exercise E, Question 13

Question:

A particle of weight 10 N is in equilibrium on a smooth plane, inclined 40° to the horizontal. A horizontal force P acts on the particle. Find P and the normal reaction between the plane and the particle.

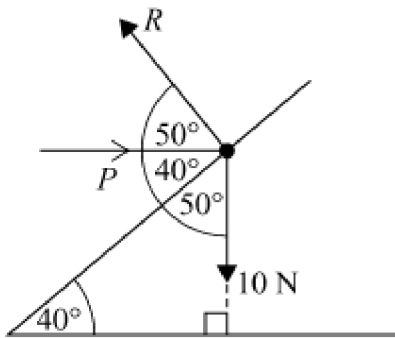
Solution:

Resolving along the plane

$$\begin{aligned} P \cos 40^\circ &= 10 \cos 50^\circ \\ P &= \frac{10 \times \cos 50^\circ}{\cos 40^\circ} \\ P &= 8.3909\dots \\ P &= 8.39 \text{ N (3 s.f.)} \end{aligned}$$

Resolving vertically

$$\begin{aligned} R \sin 50^\circ &= 10 \\ \therefore R &= \frac{10}{\sin 50^\circ} = 13.054\dots \\ R &= 13.1 \text{ N (3 s.f.)} \end{aligned}$$



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