

Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

4 Forces

Exercise B, Question 6

Question:

The resultant of two forces of magnitude F_1 and F_2 has magnitude 3 N. If $F_1 = 7$ N and $F_2 = 5$ N, calculate the angle between the two forces.

Solution:

cosine rule

$$3^2 = 7^2 + 5^2 - 2 \times 7 \times 5 \times \cos \beta$$

$$\therefore 2 \times 7 \times 5 \times \cos \beta = 7^2 + 5^2 - 3^2$$

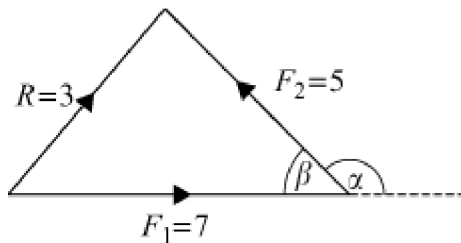
$$70 \times \cos \beta = 65$$

$$\cos \beta = \frac{65}{70}$$

$$\therefore \beta = 21.786...^\circ$$

$$\begin{aligned} \therefore \alpha &= 180^\circ - \beta \\ &= 180 - 21.786...^\circ \\ &= 158.21...^\circ \end{aligned}$$

\therefore angle between F_1 and F_2 is 158° (3 s.f.)



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