Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

4 Forces

Exercise C, Question 5

Question:

Two forces $(3i + 2j)$ N and $(-5i + j)$ N act at a point. Find the magnitude of the resultant of these forces and determine the angle which the resultant makes with the unit vector **i**. [A]

Solution:

R	$= (3i + 2j) + (-5i + j)$
R	$= -2i + 3j$
$\lvert R \rvert$	$= \sqrt{(-2)^2 + 3^2}$
	$= \sqrt{13}$
	$= 3.61$ N (3 s.f.)
then $\tan \alpha$	$= \frac{2}{3}$
gives α	$= 33.690...°$
$\therefore$ angle with i direction	$= 90 + \alpha$
	$= 90 + 33.690...°$
	$= 123.690...°$
	$= 124°$ (3 s.f.)