



QUESTION WORKBOOK

Vectors in two dimensions

Vectors · Year 12–13

7 questions · 22 marks

NAVY SCREEN EDITION

SECTION A · Warm-up

A1 Find the magnitude of $\mathbf{a} = 5\mathbf{i} + 12\mathbf{j}$, and the unit vector in the direction of $\mathbf{a}$. [2]

A2 Given $\mathbf{p} = 2\mathbf{i} - 3\mathbf{j}$ and $\mathbf{q} = -\mathbf{i} + 4\mathbf{j}$, find $2\mathbf{p} + 3\mathbf{q}$. [2]

A3 Find the magnitude of $7\mathbf{i} - 24\mathbf{j}$, and the angle it makes with the positive x -direction, to 1 decimal place. [3]

SECTION B · Standard

B1 The points $A(-2, 3)$ and $B(4, -5)$ have position vectors $\mathbf{a}$ and $\mathbf{b}$ respectively. Find the vector $\mathbf{AB}$, the distance AB , and the midpoint of AB . [4]

B2 The vectors $4\mathbf{i} + 6\mathbf{j}$ and $6\mathbf{i} + \lambda\mathbf{j}$ are parallel. Find the value of λ . [3]

B3 Find the two vectors of magnitude 26 that are parallel to $5\mathbf{i} - 12\mathbf{j}$. [3]

SECTION C · Stretch

C1 Relative to an origin O , the points A and B have position vectors $\mathbf{a} = \mathbf{i} + 6\mathbf{j}$ and $\mathbf{b} = 16\mathbf{i} + 12\mathbf{j}$. The point P lies on the line segment AB and divides it so that $AP : PB = 1 : 2$. Find the position vector of P , and hence find $|OP|$. [5]