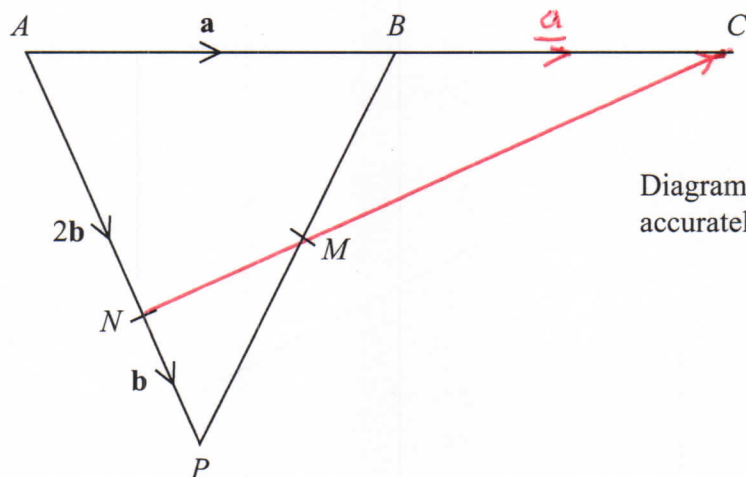


28

Diagram NOT
accurately drawn

APB is a triangle.
 N is a point on AP .

$$\vec{AB} = \mathbf{a} \quad \vec{AN} = 2\mathbf{b} \quad \vec{NP} = \mathbf{b}$$

(a) Find the vector \vec{PB} , in terms of \mathbf{a} and \mathbf{b} .

$$\begin{aligned} \vec{PB} &= \vec{PA} + \vec{AB} \\ &= -3\mathbf{b} + \mathbf{a} \end{aligned}$$

$$\vec{PB} = \mathbf{a} - 3\mathbf{b} \quad (1)$$

B is the midpoint of AC .
 M is the midpoint of PB .

* (b) Show that NMC is a straight line.

$$\begin{aligned} \vec{NM} &= \vec{NP} + \vec{PM} \\ &= \mathbf{b} + \frac{1}{2}(\mathbf{a} - 3\mathbf{b}) \\ &= \mathbf{b} + \frac{1}{2}\mathbf{a} - \frac{3}{2}\mathbf{b} \\ &= \frac{1}{2}\mathbf{a} - \frac{1}{2}\mathbf{b} = \frac{1}{2}(\mathbf{a} - \mathbf{b}) \end{aligned}$$

$$\begin{aligned} \vec{NC} &= \vec{NA} + \vec{AC} \\ &= -2\mathbf{b} + 2\mathbf{a} = 2(-\mathbf{b} + \mathbf{a}) = 2(\mathbf{a} - \mathbf{b}) \end{aligned}$$

$\therefore \vec{NM}$ and \vec{NC} are in same direction
so NMC is a straight line. (4)

(Total for Question 28 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS

