

Vectors Exam Questions MS

Q1, (OCR H240/02, Practice Paper Set 1, Q1)

(i)	$2p + 2q = 6$ $6p - 4q = -7$ eg $4p + 4q = 12$ $10p = 5$ $p = 0.5, q = 2.5$	B1 M1 A1 [3]	3.1a 1.1 1.1	Both Correct method to solve and achieve any correct equation in either p or q Both
(ii)	Vectors $3\mathbf{i} + 4\mathbf{j}$ and $5\mathbf{i}$ shown on diagram, each starting at start point of vector \mathbf{a} $k = 0.5$ or 1.5	B1B1 B1 B1 [4]	1.2 1.1 2.2a 1.1	or just end points of these vectors shown

Q2, (OCR H230/02, Specimen Question Paper, Q4)

(i)	$\overrightarrow{BC} = \begin{pmatrix} 4 \\ -2 \end{pmatrix}$ $\begin{pmatrix} 4 \\ -2 \end{pmatrix} = \begin{pmatrix} x \\ y \end{pmatrix} - \begin{pmatrix} -2 \\ 1 \end{pmatrix} = \mathbf{d} - \mathbf{a} = \overrightarrow{AD}$ $\overrightarrow{OD} = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$	B1 M1 A1 [3]	1.1 3.1a 1.1	soi
(ii)	$\overrightarrow{OM} = \begin{pmatrix} 4 \\ 4 \end{pmatrix}$ $\overrightarrow{AM} = \overrightarrow{OM} - \overrightarrow{OA} = \begin{pmatrix} 6 \\ 3 \end{pmatrix}$ $ \overrightarrow{AM} = \sqrt{6^2 + 3^2} = 3\sqrt{5}$	B1 M1 A1 [3]	1.1 1.1 2.2a	soi Accept 6.71

Q3, (OCR H230/01, Practice Paper Set 1, Q7)

(i)	(a)	$ \overrightarrow{OB} = \sqrt{1^2 + 2^2}$ Mag = $\sqrt{5}$ or 2.24 (3 sf)	M1 A1 [2]	1.2 1.1	
	(b)	Direction (= $\tan^{-1}(0.5)$) = 27° & ($180^\circ + 27^\circ$ or $\tan^{-1}(-0.5)$) = 207°	M1 A1f [2]	1.1a 1.1	ft their 27°
(ii)		For max & min OC , C lies on OA $OC = OA \pm 2$ Max $OC = \sqrt{5} + 2$ or 4.24 (3 sf) Min $OC = \sqrt{5} - 2$ or 0.236 (3 sf)	M1 M1 A1 A1 [4]	2.1 3.1a 2.2a 1.1	May be implied, eg by diagram Their OA (from (i)) ± 2