

Question		Answer	Marks	AO	Guidance	
6	(a)	(i)	P (0.5, 0)	B1	1.1	Any midpoint correct
		Q (5.5, 0.5)	B1	1.1	All midpoints correct	
		R (4, 3.5)			If no labels BOD for 1 or 2 marks	
		S (-1, 3)				
			[2]			

6	(a)	<p>(ii) Gradient PQ = 0.1 or length of PQ = $\frac{\sqrt{101}}{2}$ or vector $\overline{PQ} = \begin{pmatrix} 5 \\ 0.5 \end{pmatrix}$</p> <p>Gradient SR is $\frac{0.5}{5} = 0.1 = \text{gradient PQ}$ or length of SR = $\sqrt{0.5^2 + 5^2} = \frac{\sqrt{101}}{2}$ or vector $\overline{SR} = \begin{pmatrix} 4 - -1 \\ 3.5 - 3 \end{pmatrix} = \begin{pmatrix} 5 \\ 0.5 \end{pmatrix}$</p> <p>Gradient PS = -2 or length of PS = $\frac{3\sqrt{5}}{2}$ or vector $\overline{PS} = \begin{pmatrix} -1.5 \\ 3 \end{pmatrix}$</p> <p>Gradient QR is $\frac{3}{-1.5} = -2$ or length of QR = $\sqrt{1.5^2 + 3^2} = \frac{3\sqrt{5}}{2}$ or vector $\overline{QR} = \begin{pmatrix} 4 - 5.5 \\ 3.5 - 0.5 \end{pmatrix} = \begin{pmatrix} -1.5 \\ 3 \end{pmatrix}$</p> <p>Repeat process (as above) for other pair of opposite sides and conclude it's a parallelogram</p>	<p>B1</p> <p>M1</p> <p>E1</p> <p>[3]</p>	<p>1.1</p> <p>2.2a</p> <p>2.4</p>	<p>Gradient, length or vector of any one side of PQRS</p> <p>Or SC1 if KLMN used</p> <p>Gradient of opposite side of PQRS shown to be equal or length or vector of opposite side shown to be equal. ie some working must be seen</p> <p>Convincing completion dep on M1</p>	<p>Condone confusion of labels (eg length for gradient etc) for M1/B1</p> <p>Watch out for valid alternatives e.g. 2 sides equal length and equal gradient</p>
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6	(b)	(i)	$\overline{WX} = -3c - 3a + 3b$ $= 3(-a + b - c)$	B1 [1]	2.2a	Convincing completion $\overline{WX} = \overline{WV} + \overline{VT} + \overline{TX}$	
6	(b)	(ii)	$\overline{AH} = -a + b$ $\overline{WX} = -3c - 3a + 3b$ $\overline{WE} = -c - a + b$ $\overline{DE} = c - c - a + b = -a + b$ <p>So AH is parallel to DE</p>	B1 E1 [2]	1.1 2.4	\overline{DE} from any correct route, must be shown Convincing completion with conclusion	
6	(b)	(iii)	$\overline{BC} = a + c$ $\overline{GF} = b - (-c - a + b) = c + a$ $\overline{BC} = \overline{GF} \text{ so they are parallel}$	B1 E1 [2]	2.2a 2.4	\overline{GF} from any correct route, must be shown Convincing completion with conclusion	