

Question			Answer	Marks	AO	Guidance	
4	(a)		magnitude is $\sqrt{0.5^2 + 0.5^2} = \sqrt{0.5}$ $\sqrt{0.5}$ (or 0.707) $\neq 1$ OR $0.5 \neq 1^2$ OR would need to be $\frac{1}{2}\sqrt{2}\mathbf{i} - \frac{1}{2}\sqrt{2}\mathbf{j}$ hence not unit vector	M1 A1 [2]	1.1 2.1	Attempt to find magnitude (or magnitude ²) of given vector Make comparison using definition of a unit vector, and conclude that it is not a unit vector Any values seen must be correct	Pythagoras or trigonometry Accept $0.5 \neq 1$ as evidence Geometric arguments can gain full credit, as long as fully reasoned and convincing eg to have a length of 1 unit the two components would have to be collinear, but this is not possible as they have to be perpendicular
4	(b)		$(\tan^{-1}1 =) 45^\circ$ hence direction is 315°	M1 A1 [2]	1.1 1.1	Attempt to find a useful angle soi Could be using their magnitude from (a) with sin or cos Obtain correct direction	Implied by -45° BOD for any incorrect diagrams seen Allow 0.785 (radians) A0 for -45° Condone both 315° and -45° given A0 if in radians

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4	(c)		$3^2 + (c + 0.5)^2 = 5^2$	M1	3.1a	Attempt distance equation involving c , and equate to 5^2 oe Allow one sign error eg $3^2 + (c - 0.5)^2 = 5^2$	If spotting that the y difference is 4 then must still link to c for M1
			$c^2 + c - 15.75 (= 0)$	A1	1.1	Correct quadratic equation	Brackets expanded, but not necessarily simplified
			$c = 3.5, c = -4.5$ oe	A1	1.1	Obtain both correct values	
				[3]			SC if no method shown then B1 for each correct value of c , as ‘determine’
			Alt method for final two marks $(c + 0.5)^2 = 16$ $c + 0.5 = 4$ $c = 3.5$ oe $c + 0.5 = -4$ $c = -4.5$ oe	A1		Solve to obtain one correct value for c	
				A1		Obtain second correct value, and no others	