Question			Answer	Mark	AO	Guidance
				[2]		
2	**(a)**		$(4\mathbf{i} + 2\mathbf{j} - 5\mathbf{k}) - (3\mathbf{i} + 2\mathbf{j})$ $(= \mathbf{i} - 5\mathbf{k})$ or $(3\mathbf{i} + 2\mathbf{j}) - (4\mathbf{i} + 2\mathbf{j} - 5\mathbf{k})$ $(= 5\mathbf{k} - \mathbf{i})$	**M1**	**1.1**	**b** − **a** or **a** − **b** attempted, using **i**, **j**, **k** or column vectors May be implied by calculation seen
			$AB = \sqrt{26}$ or 5.10 (3 sf) or 5.1	**A1** **[2]**	**1.1**	www. Correct answer, no working: M1A1 Mark(s) cannot be gained retrospectively in (b)
2	**(b)**		'26' = $(p-3)^2 + 4 + 9 + (p-4)^2 + 4 + 4$	**M1**	**3.1a**	Attempt $AB^2 = BP^2 + PA^2$ (involving p) ft their AB
			Alternative methods for M1			
			Attempt $\lvert PC\rvert^2$ = (their radius)^2	**M1**		or $(\frac{7}{2} - p)^2 + 4 + \frac{1}{4} = \frac{13}{2}$
			Attempt $\overline{PA} \cdot \overline{PB} = 0$	**M1**		or $((3-p)\mathbf{i} + 2\mathbf{j} + 3\mathbf{k}) \cdot ((4-p)\mathbf{i} + 2\mathbf{j} - 2\mathbf{k}) = 0$
			$p^2 - 7p + 10 = 0$ oe or $(p - \frac{7}{2})^2 = \frac{9}{4}$	**A1f**	**1.1**	Correct simplified equation, ft their (a), ie: or $p^2 - 7p + \frac{46 - \text{their } a^2}{2} = 0$ or $(p - \frac{7}{2})^2 = \frac{\text{their } a^2 - 17}{4}$
			$p = 2$ or 5	**A1f** **[3]**	**1.1**	ft only their (a)