

	Question		Answer	Marks	AO	Guidance
3	(a)		Straight line drawn	B1	1.1	• Line through (3, 0) and (0, 6), mark intent • Condone good freehand line • Condone line stopping at axes • Ignore additional lines, perhaps as part of solution to (b) or (c), as long as it is not several attempts at (a)
				[1]		

Question			Answer	Marks	AO	• Guidance
3	(b)		A is (3, 0) and B is (0, 6)	B1	1.1	- Coordinates soi by correct midpoint - Condone labels A and B reversed or omitted - Condone missing brackets for coordinates throughout if intent is clear
			Midpoint is $\left(\frac{3}{2}, 3\right)$	M1	1.1	- Correct midpoint or correct method to find the midpoint. e.g. $\left(\frac{3+0}{2}, \frac{0+6}{2}\right)$ - Allow embedded in the equation for perp. bisector
			Gradient of AB is -2	M1	1.1	- Correct gradient or correct method to find gradient e.g. $y = -2x + c$ or $\frac{6-0}{0-3}$ or $\frac{6-3}{0-1.5}$ or $\frac{0-3}{3-1.5}$ oe - FT <i>their</i> midpoint if used - Implied by correct gradient of perpendicular bisector
			Gradient of perpendicular bisector is $\frac{1}{2}$	M1	1.1	- FT $\frac{-1}{\text{their gradient}}$ - May be seen embedded in the equation.
			Equation $(y - 3) = \frac{1}{2}\left(x - \frac{3}{2}\right)$	M1	1.1	- Using <i>their</i> midpoint and <i>their</i> gradient of perpendicular bisector - Allow $y = \frac{1}{2}x + c$ and $3 = \frac{1}{2} \times \frac{3}{2} + c$ oe
			$y = \frac{1}{2}x + \frac{9}{4}$	A1	1.1	- OR $2x - 4y = -9$ - Allow any correct equivalent simplified form e.g. $4y = 2x + 9$ or $y - \frac{1}{2}x = \frac{9}{4}$ or $\frac{1}{2}x - y + \frac{9}{4} = 0$ or any multiple of these. - Allow decimals e.g. $y = 0.5x + 2.25$ - isw after correct equation seen
				[6]		

Question			Answer	Marks	AO	Guidance
3	(c)		(AB ² = a ² + a ² =)3 ² + 6 ² Or (AC ² =)1.5 ² + 3 ² where C is the midpoint of the square a ² + a ² = 45	B1	3.1a	- Use of Pythagoras which will help to calculate side e.g. AC², BC², AB² or AC, BC, AB soi - FT <i>their</i> midpoint from (a) if used
			M1	1.1	Further working may not be seen as likely to be done by calculator	
		Alternative method 1 for M1 a ² = 2AC ² = 2(1.5 ² + 3 ²)	M1		Using AC = √1.5² + 3² where C is the midpoint of the square	
		Alternative method 2 for M1 a = √3 ² + 6 ² × cos 45° oe	M1		Use of trigonometry to find a	
		Alternative method 3 for M1 a = $\frac{\sqrt{1.5^2+3^2}}{\cos 45^\circ}$ oe	M1		- Use of trigonometry to find a - Using AC = √1.5² + 3² where C is the midpoint of the square	
		Alternative method 4 for M1 (x − 1.5) ² + (0.5x − 0.75) ² = 1.5 ² + 3 ² 4x ² − 12x − 27 = 0	M1		Use of <i>their</i> AC and <i>their</i> equation of perpendicular bisector to form a quadratic equation to give the x-coordinates of the other two vertices of the square	
		$\frac{3}{2}\sqrt{10}$ oe	A1	1.1	Accept any exact correct answer e.g. $\frac{3\sqrt{10}}{2}, \frac{3}{4}\sqrt{40}, 1.5\sqrt{10}$	
		Alternative method using vectors ($\overrightarrow{CB}$ =) $\begin{pmatrix} -1.5 \\ 3 \end{pmatrix}$ so ($\overrightarrow{CD}$ =) $\begin{pmatrix} 3 \\ 1.5 \end{pmatrix}$ where D is another vertex of the square. D is (4.5, 4.5) so a ² = (4.5 ² + 1.5 ²) $\frac{3}{2}\sqrt{10}$ oe	B1 M1 A1	 1.1	- FT <i>their</i> midpoint from (a) - Vector from C to B or A or vice versa and rotating to get vector to one of the other two vertices - Or (−1.5, 1.5) - Accept any exact correct answer e.g. $\frac{3\sqrt{10}}{2}, \frac{3}{4}\sqrt{40}, 1.5\sqrt{10}$	
	[3]					