

Q	Marking instructions	AO	Marks	Typical solution
8(a)(i)	Obtains correct y -intercept at P (0,5) or $y = 5$ seen anywhere PI by correct equation for line PQ	3.1a	B1	
	Obtains equation of PQ with correct gradient. For example $y = \frac{3}{5}x + c$ or $5y - 3x = k$ or Forms an equation for the distance or distance squared from (0,5) to a point on L_2 For example, $d^2 = x^2 + \left(-\frac{5}{3}x + \frac{68}{3}\right)^2$	3.1a	M1	At P $x = 0 \Rightarrow y = 5$
	Obtains correct equation ACF	1.1b	A1	Line PQ $3x - 5y = -25$
	Solves simultaneous equations for their PQ and L_2 to obtain values for x and y Their PQ must not be a horizontal or vertical line Condone errors in rearrangement of the equation(s) or Minimises their distance or distance squared equation to find one coordinate	3.1a	M1	$5x + 3y = 83$ (10, 11)
	Obtains (10, 11) or $x = 10, y = 11$	1.1b	A1	
Subtotal		5		

Q	Marking instructions	AO	Marks	Typical solution
8(a)(ii)	<p>Uses the distance formula to find the value of PQ or PQ^2 or</p> <p>Uses Pythagoras theorem with $10^2 + 6^2$ seen</p> <p>If the coordinates of P and Q are incorrect, differences in x and y must be clearly shown for M1</p>	1.1a	M1	
	<p>Completes demonstration to show that $k = 2$</p> <p>Must have shown clear use of distance formula</p> <p>Condone not seeing $x = 0$ substituted in the distance formula</p> <p>Answer of $2\sqrt{34}$ and no working shown scores M1 R0</p>	2.1	R1	$PQ^2 = (10 - 0)^2 + (11 - 5)^2$ $PQ = \sqrt{136} = 2\sqrt{34}$
	Subtotal		2	

Q	Marking instructions	AO	Marks	Typical solution
8(b)(i)	<p>Uses a valid method to find a. Evidence could be: Forming the equation of the line mid-way between L_1 and L_2 $5x + 3y = 49$ seen or Using $(a, -17)$ as the mid-point of a line segment from L_1 to L_2 For example: $5x + 3(-17) = 15 \quad x = 13.2$ $5x + 3(-17) = 83 \quad x = 26.8$ $a = \frac{(26.8 + 13.2)}{2} = 20$ or Finding the mid-point of PQ their $(5, 8)$ and using the gradient of L_1 and $L_2 = -\frac{5}{3}$ For example: $8 + 5(-5) = -17$ $a = 5 + 5(3) = 20$ or Substitutes $y = 17$ and $x = a$ into $y = \frac{3}{5}x + 5$</p>	3.1a	M1	$5x + 3y = 49$ $5a + 3(-17) = 49$ $a = 20$
	Deduces $a = 20$	2.2a	R1	
Subtotal			2	

Q	Marking instructions	AO	Marks	Typical solution
8(b)(ii)	Forms expression of the form $(x \pm a)^2 + (y \pm 17)^2$ using a or their value of a	1.1a	M1	$(x - 20)^2 + (y + 17)^2 = 34$
	Obtains correct equation for their value of a and their radius ² = $\frac{17k^2}{2}$ from part (a)(ii) for an integer value of k Condone $(\sqrt{34})^2$	1.1b	A1F	
Subtotal			2	

Question 8 Total			11	
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