

1(a)	(2, 7)		1	
1(b)(i)	$\frac{3}{2}$ oe		2	M1 for $\frac{13-1}{6--2}$ oe
1(b)(ii)	$-\frac{1}{\text{their (b)(i)}}$ oe		1	Strict FT <i>their (b)(i)</i>
2(a)	$(e-6)^2 + (e-4)^2$ oe or $\sqrt{(e-6)^2 + (e-4)^2}$ oe		M1	
	$e^2 - 10e + 16 [=0]$ or $2e^2 - 20e + 32 [=0]$		A2	A1 for $e^2 - 6e - 6e + 36$ oe or $e^2 - 4e - 4e + 16$ oe
	$(e-2)(e-8) [=0]$ oe or $\frac{-(-10) \pm \sqrt{(-10)^2 - 4 \times 1 \times 16}}{2 \times 1}$ oe		M1	FT for factorising or correct use of formula for <i>their</i> 3-term quadratic
	(2, 2) and (8, 8)		B1	
2(b)(i)	2 nfw		4	B1 for [grad perpendicular =] $-\frac{2}{3}$ soi M2 for $\frac{5f-6}{-f-4} = \text{their} \left(-\frac{2}{3}\right)$ oe or M1 for $\frac{5f-6}{-f-4}$ oe or $6 = \text{their} \left(-\frac{2}{3}\right) \times 4 + c$ oe
2(b)(ii)	13 with (1, 8) seen		3	M1 for $\left(\frac{4+(-\text{their}f)}{2}, \frac{6+(5 \times \text{their}f)}{2}\right)$ M1 for substituting <i>their</i> (1, 8) into $2y = 3x + k$ oe
3(a)	(a, a) with $a \neq 1, 3$ or 5		2	SC1 for answer (1, 1) or (5, 5)
3(b)	$y = -\frac{1}{2}x - \frac{1}{2}$ oe nfw		5	M1 for [gradient AB =] $\frac{3-(-5)}{3-(-1)}$ oe M1 for [gradient M =] $-\frac{1}{\text{their gradient AB}}$ B1 for (1, -1) M1 for <i>their</i> (1, -1) substituted into $y = \text{their} \left(-\frac{1}{2}\right)x + c$ oe

4(a)	-8	2	M1 for $3 \times 7 + 2h = 5$ oe
4(b)	$y = \frac{3}{2}x + 19$ oe	4	B1 for gradient of original line $-\frac{2}{3}$ soi M1 for $-\frac{1}{\text{their gradient}}$ M1 for substituting (their -8, 7) in $y = \text{their} \left(\frac{3}{2} \right) x + c$
5(a)	$(7 - (-1))^2 + (0 - 6)^2$	M1	
	$BC = 10$	B1	
	correct completion to $AB = BC [= 10]$	A1	
5(b)	40	2	M1 for $\frac{1}{2} \times \text{their}(BC) \times (7 - (-1))$ oe
6(a)	$(1, 2\frac{1}{2})$	1	
6(b)	$-\frac{3}{8}$ oe	1	
6(c)	P, with supporting evidence, nfww e.g. $OP = 5, OR = 6$	2	B1 for $OR = 6$ nfww or M1 for $\sqrt{(-3)^2 + 4^2}$, or better
7(a)	$(-1, \frac{1}{2})$ or $(-1, 0.5)$ cao	1	
7(b)	$\frac{1}{2}$ oe	1	
7(c)	$[\text{Gradient of } BC =] \frac{-8}{4}$	M1	Alternative 1: M1 for
	$\frac{1}{2} \times \frac{-8}{4} = -1$ hence perpendicular	A1	$\frac{1}{2} \times m_{BC} = -1$ or $m_{BC} = -\frac{1}{0.5}$ oe leading to $m_{BC} = -2$ A1 for gradient of $BC = \frac{-8}{4} = -2$ hence perpendicular Alternative 2: M1 for $\overline{AB} = \begin{pmatrix} 6 \\ 3 \end{pmatrix}$ oe and $\overline{AC} = \begin{pmatrix} 10 \\ -5 \end{pmatrix}$ oe A1 for $(4^2 + 8^2) + (6^2 + 3^2) = (10^2 + 5^2)$ hence perpendicular

8(a)	-2	1	
8(b)	$y = -2x + 4$ or FT $y = (\text{their(a)})x + 4$ or $y = (\text{their(a)})(x + 3) + 10$	1	
8(c)	(3, -2)	2	C1 for one correct coordinate
9(a)	$y = 2x + 3$ oe	2	C1 for $y = 2x + c$ o.e. or $y = mx + 3$ oe $m \neq 0$ or $2x + 3$ or M1 for gradient = 2 or intercept = 3 soi
9(b)	9	2	M1 for $\frac{5 - -1}{1 - p} = -\frac{3}{4}$ oe or for $5 = -\frac{3}{4} \times 1 + c$ and $-1 = -\frac{3}{4} \times p + c$ seen
10 (a)	(-4, 2) (6, 2)	1	Both correct
(b)	(-3, -1) (5, 5)	2	C1 for one correct or for two x-values or two y-values correct or for both (4, 6) and (-2, -2)
11 (a)	$(4, -\frac{1}{2})$	1	
(b)	$\frac{5}{6}$	1	
(c) (i)			
(ii)	-2.5, or any equiv.	1	

12 (i)	$\frac{1}{2}$ or 0.5 cao	1	
(ii)	$y = 1$ final answer	1	
(iii)	Line from (6, 1) to (4, 3)	1	
(iv)	$y = -x + 7$ final answer	2	B1 for any equation with grad -1 and/or intercept 7
(v)	(0, 6)	2	B1 for line from (2, 2) with y-intercept between 5 and 7 soi Or for correct (unsimplified) equation ($y = -2x + 6$)

13	(a)	$\left(-\frac{1}{2}, 1\right)$	1	C1 for one correct coordinate
	(b)	$-\frac{6}{7}$	1	
	(c)	(i) (10, -8) (ii) $\frac{1}{3}$	2 1	
14	(a)	(2, 1)	1	C1 for $(\sqrt{\quad}) 52$ or M1 for $6^2 + (-4)^2$, or for $6^2 + (4)^2$, etc.
	(b)	$-\frac{2}{3}$ or any equiv. value	1	
	(c)			
15	(a)	$-\frac{1}{3}$	1	
	(b)	-1	1	
16	(a)	(-3, 2.5) oe	1	B1 for $m = \frac{1}{2}$ or $c = 4$ soi
	(b)	$y = \frac{1}{2}x + 4$ isw	2	
17	(a)	$\begin{pmatrix} 6 \\ 2 \end{pmatrix}$	1	M1 for $7P + Q = 0$ or $9P + Q = -6$ or B1 for an equation with $m =$ their (b) or $c = 7$
	(b)	$\frac{1}{3}$ oe isw	1	
	(c)	$P = -3$ $Q = 21$	2	
	(d) (i)	(18, -5)	1	
	(d) (ii)	(\pm) 13	1	
	(iii) (a)	(12, 11)	2	B1 for $(x =) 12$
18	(a)	(0.5, 4) oe	1	B1 for substitution of (-2, 1) in $2y + 3x + k = 0$ SC1 for answer -23 or any correct ft after substitution of ($\pm 2, \pm 1$)
	(b)	1.2 oe	1	
	(c) (i)	4	2	
	(c) (ii)	-1.5 oe	1	

19	<p>(a) -2 5.5</p> <p>(b) $y = -0.75x + 4$</p>	<p>1</p> <p>2</p>	<p>C1 for $y = -0.75x + c$ or $y = mx + 4$ or B1 for $m = -0.75$ or $c = 4$ soi or a line through either point $(-8, 10)$ or $(4, 1)$</p>
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Mega Lecture