

Topical Worksheets for Cambridge O LEVEL Mathematics D (4024)

Coordinate Geometry

Mark Scheme

1st edition, for examination until 2025

- Mark Scheme

Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	2x - 3	2		B1 for $kx - 3$ or $2x + k$ $k \neq -3$	
1(b)	Ruled line perpendicular to L	1			
				1	[Total: 1
Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	(3, 1)	1			
1(b)	D plotted at $(-2, -1)$	1			
1(c)	E plotted at (1, -2)	2		B1 for <i>E</i> plotted at $(1, k)$ or $(k, -2)$ or $\overrightarrow{AE} = \begin{pmatrix} 4\\ -3 \end{pmatrix}$	
					[Total: 4
Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	3	2		M1 for $\frac{3k}{1k}$	
1(b)	y = 3x - 2 oe	1		FT their (a)	
			٠.	07	[Total:]
Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	4 7 4	2		B1 for one correct	
1(b)	Correct curve	4	amb	B3FT for 6 or 7 points correct or B2FT for 4 or 5 points correct or B1FT for 2 or 3 points correct	
1(c)	x = 1 oe				
1(d)	-1.9 to -1.7 and 3.7 to 3.9	0		B1 for each	
	80	X			[Total:

7

Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	Kite	1			
1(b)(i)	$ \begin{array}{c} \text{Translation} \\ \left(\begin{array}{c} 4 \\ 9 \end{array}\right) \end{array} $	2		B1 for each	
1(b)(ii)	Reflection $x = 0.5$ oe	2		B1 for each	
1(b)(iii)	Rotation 90° clockwise oe [centre] (0, 0) oe	3		B1 for each	
1(c)(i)	(-5, -6)	1			
1(c)(ii)	Image at (-5, 0), (-2, 3), (7, 0),(-2, -3)	2		B1 for correct size, wrong position or correct shape with incorrect scale factor	
				II	[Total: 11
Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	(-1, -2)	1		~	
1(b)	$\begin{pmatrix} 6\\0 \end{pmatrix}$	1	•	89	
1(c)	C marked at (3, 3)	1			
1(d)(i)	$\begin{pmatrix} 4\\5 \end{pmatrix}$	1	~0.	FT their (b) + $\begin{pmatrix} -2\\5 \end{pmatrix}$	
1(d)(ii)	AC	1			
1(e)(i)	Correct parallelogram drawn	C	0	FT <i>their</i> (c) provided ABCD forms a parallelogram	
1(e)(ii)	30 cm ²	3		FT the area of <i>their</i> ABCD provided it is a parallelogram. B1 for each	
	Ro				[Total: i

15.7 or 15.65 M1 for $\frac{-10-4}{4-3}$ [= -2] oe A1 for 10 = -2 (-3) + c or -4 = -2 (4) + c and correct completion to y = -2x + 4	3		M2 for $\sqrt{(-4-10)^2 + (43)^2}$ oe or M1 for $(-4-10)^2 + (43)^2$ oe	
A1 for $10 = -2(-3) + c$ or -4 = -2(4) + c and correct completion to	2		oe or M1 for $(-4-10)^2 + (4-3)^2$	
A1 for $10 = -2(-3) + c$ or -4 = -2(4) + c and correct completion to	2		or M1 for $(-4 - 10)^2 + (43)^2$	
A1 for $10 = -2(-3) + c$ or -4 = -2(4) + c and correct completion to	2		$(-4-10)^2 + (43)^2$	
A1 for $10 = -2(-3) + c$ or -4 = -2(4) + c and correct completion to	2		oe	
A1 for $10 = -2(-3) + c$ or -4 = -2(4) + c and correct completion to	2			
A1 for $10 = -2(-3) + c$ or -4 = -2(4) + c and correct completion to				
-4 = -2(4) + c and correct completion to				
and correct completion to				
y = -2x + 4				_
$y = \frac{1}{2}x + \frac{11}{4}$ oe	4		M1 for grad = $\frac{1}{2}$ soi	
2 4			M1 for [midpoint =] $(\frac{1}{2},$	
			M1 for substitution of $\begin{pmatrix} 1 \\ -3 \end{pmatrix}$ into	
			$(\frac{1}{2}, 5)$ into their $y = mx + c$ oe	
		-		
Answer	Marks	AO Element	Notes	Guidance
(0, -2)	1			
				[]
Answer	Marks	AO Element 🔶	Notes	Guidance
3	2		M1 for $8y = 3x + 20$ or	
8			better	
(0, 2.5) oe	1			
				[]
				L1
par	ja.			
	3/8 (0, 2.5) oe	(0, -2) 1 Answer Marks 3/8 2 (0, 2.5) oe 1	(0, -2) 1 Answer Marks AO Element 3/8 2 1	3) MI for substitution of $(\frac{1}{2}, 3)$ into their $y = mx + c$ oeAnswerMarksAO ElementNotes(0, -2)1AnswerMarksAnswerMarksAnswerMarksA0 ElementNotes32(0, 2.5) oe1

Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	15.6 or 15.62	3		$\frac{M2 \text{ for}}{\sqrt{(93)^2 + (-2-8)^2}}$ oe seen or M1 for $(93)^2$ or $(-2-8)^2$ oe seen	
1(b)	$y = -\frac{5}{6}x + 4 \text{ oe}$	3		M1 for gradient $\frac{-2-8}{93}$ oe M1 for substituting (6, -1) into a linear equation oe	
1(c)	$y = \frac{6}{5}x - \frac{3}{5}$ oe	4		M1 for gradient $-1/their\left(-\frac{5}{6}\right)$ B1 for midpoint at (3, 3) M1 for their midpoint substituted into $y = their \ m \times x + c$ oe	
				0	[Total: 1
Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	4 <i>x</i> + 2	3	j.	B2 for $4x + c$ or B1 for $mx + 2$, $m \neq 0$ and M1 for rise/run of $\frac{4k}{k}$	
1(b)(i)	3	1	N		
1(b)(ii)	(0, -4)	1			
1(c)	Correct ruled line from $x = -4$ to $x = 5$	Pa	ð.	B2 for 2 correct points plotted or B1 for one correct point plotted soi or M1 for line with gradient –2 If B0 or M0 scored, SC1 for a correct table with a minimum of 3 correct coordinates	
					[Total:
Question	Answer	Marks	AO Element	Notes	Guidance
Question	-3, -1	Marks 1	AO Element	Notes	Guidance
			AO Element	Notes M1 for rise \div run e.g. $\frac{6}{4}$	Guidance
_1(a)	-3, -1	1	AO Element		Guidance
,l(a) 1(b)	-3, -1 1,5 oe	2	AO Element	M1 for rise \div run e.g. $\frac{6}{4}$ B1 for $jx - 1$ $j \neq 0$ or $1.5x + k$	
,l(a) 1(b)	-3, -1 1,5 oe	2	AO Element AO Element	M1 for rise \div run e.g. $\frac{6}{4}$ B1 for $jx - 1$ $j \neq 0$ or $1.5x + k$	Guidance [Total: : Guidance

2					
Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	y = 2x - 3 oe	3		B2 for $2x - 3$ or $y = their m x - 3$	
				or $y = 2x + c$	
				or M1 for $\frac{9 - (-3)}{6 - 0}$ oe	
				or $9 = 6m - 3$ oe or B1 for $2x$ seen	
				or $[y =]mx - 3 m \neq 0$	
1(b)	$y = -\frac{1}{2}x + 2 \text{ oe}$	2		FT their (a)	
	2			$y = -\frac{1}{theirm}x + 2$	
				B1 for gradient $-\frac{1}{2}$,	
				gradient FT <i>their</i> (a) or for $y = mx + 2$ $m \neq 0$	
				$\sin 100 y = mx + 2 m \neq 0$	
			·		[Total:
Question	Answer	Marks	AO Element	Notes	Guidance
1	3	1			
				0	[Total:
Question	Answer	Marks	AO Element	Notes	Guidance
1	13.9 or 13.92 to 13.93	3		M2 for $\sqrt{(7-2)^2 + (121)^2}$	
			۰.	oe	
				or M1 for $(7-2)^2 + (121)^2$	
				(7-2) + (121) oe	
					[Total:
Question	Answer	Marks	AO Element	Notes	Guidance
					74
1	y = 6x oe	1			
1	y = 6x oe		9		[Total:
Question	y = 6x oe Answer	1 Marks	AO Element	Notes	[Total: Guidance
		C	AO Element	Notes	
Question	Answer	C	AO Element	Notes	
Question	Answer	C	AO Element AO Element	Notes Notes	Guidance
Question 1	Answer (0, -3)	Marks			Guidance [Total:
Question 1 Question	Answer (0, -3)	Marks Marks		Notes B1 for 2 correct B3FT for 6 or 7 points	Guidance [Total:
Question 1 Question 1(a)	Answer (0, -3) Answer -3 -3 5	Marks A 2		Notes B1 for 2 correct B3FT for 6 or 7 points correct	Guidance [Total:
Question 1 Question 1(a)	Answer (0, -3) Answer -3 -3 5	Marks A 2		Notes B1 for 2 correct B3FT for 6 or 7 points correct or B2FT for 4 or 5 points correct	Guidance [Total:
Question 1 Question 1(a)	Answer (0, -3) Answer -3 -3 5	Marks A 2		Notes B1 for 2 correct B3FT for 6 or 7 points correct or B2FT for 4 or 5 points	Guidance [Total:
Question 1 Question 1(a)	Answer (0, -3) Answer -3 -3 5	Marks A 2		Notes B1 for 2 correct B3FT for 6 or 7 points correct or B2FT for 4 or 5 points correct or B1FT for 2 or 3 points	Guidance [Total:
Question 1 Question 1(a) 1(b)	Answer (0, -3) -3 5 2 Correct curve	Marks 0 Marks 2 4		Notes B1 for 2 correct B3FT for 6 or 7 points correct or B2FT for 4 or 5 points correct or B1FT for 2 or 3 points	Guidance [Total:
Question 1 Question 1(a) 1(b) 1(b) 1(c)(i)	Answer (0, -3) Answer -3 5 2 Correct curve Ruled line x = 1 drawn	Marks 2 4		Notes B1 for 2 correct B3FT for 6 or 7 points correct or B2FT for 4 or 5 points correct or B1FT for 2 or 3 points	Guidance [Total:
Question 1 Question 1(a) 1(b) 1(b) 1(b) 1(c)(i) 1(c)(ii)	Answer $(0, -3)$ Answer -3 5 Correct curve Ruled line $x = 1$ drawn $x = 1$	Marks 1 Marks 2 4 1 1 1		Notes B1 for 2 correct B3FT for 6 or 7 points correct or B2FT for 4 or 5 points correct or B1FT for 2 or 3 points correct B1 for each If 0 scored, B1 for y = 4	Guidance [Total:
Question 1 Question 1(a) 1(b) 1(b) 1(b) 1(c)(i) 1(c)(ii)	Answer $(0, -3)$ Answer -3 5 Correct curve Ruled line $x = 1$ drawn $x = 1$	Marks 1 Marks 2 4 1 1 1		Notes B1 for 2 correct B3FT for 6 or 7 points correct or B2FT for 4 or 5 points correct or B1FT for 2 or 3 points correct B1FT for 2 or 3 points correct B1FT for 2 or 3 points correct B1FT for 2 or 3 points correct	Guidance [Total:
Question 1 Question 1(a) 1(b) 1(b) 1(b) 1(c)(i) 1(c)(ii)	Answer $(0, -3)$ Answer -3 5 Correct curve Ruled line $x = 1$ drawn $x = 1$	Marks 1 Marks 2 4 1 1 1		Notes B1 for 2 correct B3FT for 6 or 7 points correct or B2FT for 4 or 5 points correct or B1FT for 2 or 3 points correct B1 for each If 0 scored, B1 for y = 4	Guidance [Total:
Question 1 Question 1(a) 1(b) 1(c)(i) 1(c)(ii) 1(d)	Answer $(0, -3)$ Answer -3 5 -3 5 2 Correct curve Correct curve $x = 1$ -0.5 to -0.3 and 2.3 to 2.5	Marks C Marks C A A A A A A A A A A A A A A A A A A		Notes B1 for 2 correct B3FT for 6 or 7 points correct or B2FT for 4 or 5 points correct or B1FT for 2 or 3 points correct B1 for each If 0 scored, B1 for y = 4	Guidance [Total:
Question 1 Question 1(a) 1(b) 1(b) 1(c)(i) 1(c)(ii) 1(d) 1(e)(i)	Answer $(0, -3)$ Answer -3 -3 5 Correct curve Ruled line $x = 1$ drawn $x = 1$ -0.5 to -0.3 and 2.3 to 2.5 Correct ruled continuous line	Marks 2 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Notes B1 for 2 correct B3FT for 6 or 7 points correct or B2FT for 4 or 5 points correct or B1FT for 2 or 3 points correct B1 for each If 0 scored, B1 for y = 4 drawn B2 for [y =] 2x + k	Guidance [Total:
Question 1 Question 1(a) 1(b) 1(b) 1(c)(i) 1(c)(ii) 1(d) 1(e)(i)	Answer $(0, -3)$ Answer -3 -3 5 Correct curve Ruled line $x = 1$ drawn $x = 1$ -0.5 to -0.3 and 2.3 to 2.5 Correct ruled continuous line	Marks 2 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Notes B1 for 2 correct B3FT for 6 or 7 points correct or B2FT for 4 or 5 points correct or B1FT for 2 or 3 points correct B1 for each If 0 scored, B1 for y = 4 drawn	Guidance [Total:

Question	Answer	Marks	AO Element	Notes	Guidance
1(a)(i)	16	1			
1(a)(ii)	12	1			
1(b)(i)	(5, 2)	1		+	
1(b)(ii)A	(-5, 2)	1			
1(b)(ii)B	(5, 10)	2		B1 for (5, <i>k</i>) or (7, 2)	
1(b)(iii)	()	2		FT their (b)(i)	
	$\begin{pmatrix} 44\\-14 \end{pmatrix}$	2		B1 for $\begin{pmatrix} 44\\ k \end{pmatrix}$ or $\begin{pmatrix} 49 - their5\\ k \end{pmatrix}$ or $\begin{pmatrix} k\\ -14 \end{pmatrix}$ or $\begin{pmatrix} k\\ -12 - their2 \end{pmatrix}$	
1(c)(i)	Enlargement (SF) 0.5 oe (centre) (-3, 1)	3		B1 for each	
1(c)(ii)	Rotation 180° (centre) (4, 8)	3	•	B1 for each	
24-16					[Total:
Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	-1	2	A.	M1 for $[a =] \frac{2}{3} \times 9 - 7$ or better	
1(b)	15		0.	M1 for $3 = \frac{2}{3}b - 7$ or better	
		0			[Total
Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	y = -2 drawn, ruled	1			
1(b)	y = -2x drawn, ruled	1			
					[Total
Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	1.5 oe	1			
1(b)	(0, 2)	1			
					[Total
Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	12.6 or 12.64 to 12.65	3		$M2 \text{ for} \sqrt{(84)^2 + (5-1)^2} oe M1 \text{ for} (84)^2 + (5-1)^2 oe$	
1(b)	(2, 3)	2		B1 for each	
1(b)	. S. F. F.				

Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	[<i>y</i> =] 4 <i>x</i> + 5	3		B2 for answer [y =] 4x + c oe (c can be numeric or algebraic) OR M2 for $\frac{y-9}{x-1} = \frac{9-(-3)}{1-(-2)}$ oe OR M1 for $\frac{93}{12}$ oe M1 for correct substitution of $(-2, -3)$ or (1, 9) into y = (their m)x + c oe	
1(b)	76[.0] or 75.96	2		M1 for tan[] = 4 oe	
1(c)(i)	$[y=]-\frac{1}{4}x+\frac{23}{8}$ oe	3	amori	B2FT for $[y =]$ $-\frac{1}{their m \text{ from } (a)} x+c$ oe (c can be numeric or algebraic) OR M2 for $\frac{y-2}{x-3.5}$ $\frac{1}{their m \text{ from } (a)}$ oe OR M1 for $-\frac{1}{their m \text{ from } (a)}$ soi M1 for correct substitution of $(3.5, 2)$ into y = (their m)x + c oe	
1(c)(ii)	(-4.5, 4)			B1 for each value or for $\begin{pmatrix} -8\\2 \end{pmatrix}$ seen	
*****	Pal	2	·		[Total: 10]

	Answer	Marks	AO Element	Notes	Guidance
1(a)	y = -2x + 6 oe final answer	3		B2 for $y = -2x + c$ oe or $y = mx + 6$ oe $m \neq 0$ or for answer $-2x + 6$ or B1 for [gradient =] $-\frac{6}{3}$ oe or $c = +6$ soi	
1(b)	y = 0.5x - 1.5 oe final answer	3		B1 for [gradient =] –1 divided by <i>their</i> gradient from (b)(i) evaluated soi M1 for substitution of (9, 3) into y = (their m)x+c seen in	
				working	
					[Total:)
Question	Answer	Marks	AO Element	Notes	Guidance
1	$[y =] \frac{5}{8}x + \frac{7}{4}$	4		M1 for $\frac{-5-3}{7-2}$ oe M1 for $-1/their - \frac{8}{5}$ M1 for $3 = 2 \times their$ gradient + c oe	
					[Total:
Question	Answer	Marks	AO Element	Notes	Guidance
1	(4.5, -1)	2		B1 for each	
					[Total:
Question	Answer	Marks	AO Element	Notes	Guidance
1	$[y=] - \frac{1}{2}x + 3$	3	31	B2 for $[y =] - \frac{1}{2}x + c$ or	
	2			M1 for $\frac{rise}{run}$ or $m = \pm \frac{1}{2}$ oe and B1 for $[y =]kx + 3$, $k \neq 0$ or $c = 3$	
	00	a		M1 for $\frac{rise}{run}$ or $m = \pm \frac{1}{2}$ oe and B1 for $[y =]kx + 3, k \neq 0$	[Total:
Question	Answer	Marks	AO Element	M1 for $\frac{rise}{run}$ or $m = \pm \frac{1}{2}$ oe and B1 for $[y =]kx + 3, k \neq 0$	[Total: Guidance
Question 1(a)	20			M1 for $\frac{rise}{run}$ or $m = \pm \frac{1}{2}$ oe and B1 for $[y =]kx + 3$, $k \neq 0$ or $c = 3$	
	Answer	Marks		M1 for $\frac{rise}{run}$ or $m = \pm \frac{1}{2}$ oe and B1 for $[y =]kx + 3, k \neq 0$ or $c = 3$ M1 for $\frac{Rise}{Run}$	
1(a)	Answer 1 2 or 0.5	Marks 2		M1 for $\frac{rise}{run}$ or $m = \pm \frac{1}{2}$ oe and B1 for $[y =]kx + 3$, $k \neq 0$ or $c = 3$ M1 for $\frac{Rise}{Run}$ e.g. $\frac{2}{4}$ or $\frac{21}{24}$ FT their (a) e.g.	Guidance
1(a)	Answer 1 2 or 0.5	Marks 2		M1 for $\frac{rise}{run}$ or $m = \pm \frac{1}{2}$ oe and B1 for $[y =]kx + 3$, $k \neq 0$ or $c = 3$ M1 for $\frac{Rise}{Run}$ e.g. $\frac{2}{4}$ or $\frac{21}{24}$ FT their (a) e.g.	Guidance
1(a) 1(b)	Answer $\frac{1}{2}$ or 0.5 $y = \frac{1}{2}x + 1$ oe	Marks 2 1	AO Element	M1 for $\frac{rise}{run}$ or $m = \pm \frac{1}{2}$ oe and B1 for $[y =]kx + 3, k \neq 0$ or $c = 3$ M1 for $\frac{Rise}{Run}$ e.g. $\frac{2}{4}$ or $\frac{21}{24}$ FT their (a) e.g. [y =] their (a) x + 1 oe	[Total:
1(a) 1(b) Question	Answer $\frac{1}{2}$ or 0.5 $y = \frac{1}{2}x + 1$ oe Answer	Marks 2 1 Marks	AO Element	M1 for $\frac{rise}{run}$ or $m = \pm \frac{1}{2}$ oe and B1 for $[y =]kx + 3, k \neq 0$ or $c = 3$ M1 for $\frac{Rise}{Run}$ e.g. $\frac{2}{4}$ or $\frac{21}{24}$ FT their (a) e.g. [y =] their (a) x + 1 oe	Guidance [Total:

Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	(5, 3)	1			
1(b)	Point plotted at (4, -3)	1			
1(c)	$\begin{pmatrix} -8\\2 \end{pmatrix}$	1			
					[Total
Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	4 cao	1			
1(b)	-6 cao	1			
					[Total
Question	Answer	Marks	AO Element	Notes	Guidance
1	$\left(2w, \frac{r+t}{2}\right)$ final answer	2		$\frac{B1 \text{ for } 2w \text{ oe nfww or}}{\frac{r+t}{2} \text{ oe}}$	
					[Tota]
Question	Answer	Marks	AO Element	Notes	Guidance
			, pri	MI for $\frac{7-2}{9-1}$ oe MI for gradient of perpendicular = $\frac{-1}{their 0.5}$ MI for (1, 3) correctly substituted into <i>their</i> y = -2x + c	
					[Total
Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	$y = \frac{1}{2}x + 2 \text{ oe}$	2a		M2 for gradient = $-\frac{1}{2}$ oe soi or M1 for rise / run or gradient = $\frac{1}{2}$ and B1 for y = mx + 2, $m \neq 0$	
1(b)	Correct ruled line for $-5 \le x \le 5$	2		B1 for line through $(0, -1)$ or line parallel to line <i>L</i> or correct short line at least from $(-4, 1)$ to $(4, -3)$	
					[Total
Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	(-2, 5)	1			
1(b)	$\begin{pmatrix} 4\\ -3 \end{pmatrix}$	1			
1(c)	(5, 4) plotted	1			
1(d)	B1 for parallelogram <i>PQRS</i> correctly drawn B1 for (1, 7)	2		FT <i>their R</i> FT <i>their S</i> dep on first B1	
		1			

Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	(5, 6)	1			
1(b)	$[y=] - \frac{4}{5}x + 3 \text{ nfww}$	3		B2 for $[y =] - \frac{4}{5}x + c$	
				nfww or M1 for $\frac{rise}{run}$ using any	
				two of $(-5, 7)$, $(0, 3)$ and $(5, -1)$	
				and B1 for $[y =]mx + 3$ $(m \neq 0)$	
1(c)	$y = -\frac{4}{5}x - 2 \text{ oe}$	2		FT their gradient from (b)	
				B1 for $y = (their gradient)x + c (c not 0) or for$	
				or for $-\frac{4}{5}x - 2$ ($m \neq 0$) or for $-\frac{4}{5}x - 2$ alone	
1(4)(i)	5	3			
1(d)(i)	$y = \frac{5}{4}x + 4 \text{ oe}$	3		M1 for $\frac{1}{their \text{ gradient}}$ from (b)	
				M1 for (8, 14) substituted into <i>their</i> $y = mx + c$ or y = 14	
				$\frac{y-14}{x-8} = m$ or better	
1(d)(ii)	8.54 or 8.544	3		M2 for $(14 - their6)^2 + (8 - their5)^2$ or better or M1 for 14 - their 6	
				and $8 - their 5$ seen	
1(d)(iii)	(4, 6)	2		B1 for each	IT
			10 Element		[Total:
Question	Answer	2 Marks	AO Element	Notes	[Total: Guidance
Question 1(a)	Answer -3, 17		AO Element	Notes B1 for each	
Question	Answer		AO Element	Notes B1 for each B3 FT for 10 or 11 points or B2 FT for 8 or 9	
Question 1(a)	Answer -3, 17		AO Element	Notes B1 for each B3 FT for 10 or 11 points	
Question 1(a)	Answer -3, 17		AO Element	Notes B1 for each B3 FT for 10 or 11 points or B2 FT for 8 or 9 points or B1 FT for 6 or 7	
Question 1(a) 1(b)	Answer -3, 17 Fully correct curve Correct ruled targent for <i>their</i> curve	Marks	AO Element	Notes B1 for each B3 FT for 10 or 11 points or B2 FT for 8 or 9 points or B1 FT for 6 or 7	
Question 1(a) 1(b) 1(c)(i)	Answer -3, 17 Fully correct curve Correct ruled tangent for <i>their</i> curve through (0, -17)	Marks	AO Element	Notes B1 for each B3 FT for 10 or 11 points or B2 FT for 8 or 9 points or B1 FT for 6 or 7	
Question 1(a) 1(b) 1(c)(i) 1(c)(ii)	Answer -3, 17 Fully correct curve Correct ruled tangent for <i>their</i> curve through (0, -17) (1,7 to 2.2, -1 to 2.5)	Marks	AO Element	NotesB1 for eachB3 FT for 10 or 11 pointsor B2 FT for 8 or 9 pointsor B1 FT for 6 or 7 points $(y = y) = y = 1 - c$ OR	
Question 1(a) 1(b) 1(c)(i) 1(c)(ii)	Answer -3, 17 Fully correct curve Correct ruled tangent for <i>their</i> curve through (0, -17) (1,7 to 2.2, -1 to 2.5)	Marks	AO Element	Notes B1 for each B3 FT for 10 or 11 points or B2 FT for 8 or 9 points or B1 FT for 6 or 7 points M2dep for answer $[y =]9x[+] - c$ OR M1dep for gradient =	
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Question 1(a) 1(b) 1(c)(i) 1(c)(ii) 1(c)(iii)	Answer -3, 17 Fully correct curve Correct ruled tangent for <i>their</i> curve through (0, -17) (4.7 to 2.2, -1 to 2.5) [y=] 9x - 17 final answer	Marks	AO Element	NotesB1 for eachB3 FT for 10 or 11 pointsor B2 FT for 8 or 9 pointsor B1 FT for 6 or 7 points $y = 9x [+] - c$ ORM1dep for gradient = $\frac{rise}{run}$ for their tangent at any pointB1 for answer $[y =]xx[+] - 17 \ (k \neq 0)$ B2 for $y = 3x + 2$ ruled or B1 for $[y =] 3x + 2$ soi	
Question 1(a) 1(b) 1(c)(i) 1(c)(ii) 1(c)(iii)	Answer -3, 17 Fully correct curve Correct ruled tangent for <i>their</i> curve through $(0, -17)$ (k,7 to 2.2, -1 to 2.5) [y =] 9x - 17 tinal answer y = 3x + 2 ruled correctly and	Marks	AO Element	NotesB1 for eachB3 FT for 10 or 11 pointsor B2 FT for 8 or 9 pointsor B1 FT for 6 or 7 pointsor B1 FT for 6 or 7 pointsM2dep for answer $[y =]9x[+] - c$ ORM1dep for gradient = $rise$ for their tangent at any pointB1 for answer $[y =]kx[+] - 17 \ (k \neq 0)$ B2 for $y = 3x + 2$ ruled or $y = 3x + k$ ruled	
Question 1(a) 1(b) 1(c)(i) 1(c)(ii) 1(c)(iii)	Answer -3, 17 Fully correct curve Correct ruled tangent for <i>their</i> curve through $(0, -17)$ (k,7 to 2.2, -1 to 2.5) [y =] 9x - 17 final answer y = 3x + 2 ruled correctly and -2.2 to -2.1	Marks	AO Element	NotesB1 for eachB3 FT for 10 or 11 pointsor B2 FT for 8 or 9 pointsor B1 FT for 6 or 7 pointsM2dep for answer $[y =]9x [+] - c$ ORM1dep for gradient = $\frac{rise}{run}$ for their tangent at any pointB1 for answer $[y =]kx [+] - 17 \ (k \neq 0)$ B2 for $y = 3x + 2$ ruled or B1 for $[y =]3x + 2$ soi or $y = 3x + k$ ruled	
Question 1(a) 1(b) 1(c)(i) 1(c)(ii) 1(c)(iii)	Answer-3, 17Fully correct curveCorrect ruled tangent for <i>their</i> curve through $(0, -17)$ $(4,7 to 2.2, -1 to 2.5)$ $[y =] 9x - 17$ final answer $y = 3x + 2$ ruled correctly and $-2.2 \dots to -2.1$ $-0.6 to -0.4$	Marks	AO Element	NotesB1 for eachB3 FT for 10 or 11 pointsor B2 FT for 8 or 9 pointsor B1 FT for 6 or 7 pointsM2dep for answer $[y =]9x [+] - c$ ORM1dep for gradient = $\frac{rise}{run}$ for their tangent at any pointB1 for answer $[y =]xx [+] - 17 \ (k \neq 0)$ B2 for $y = 3x + 2$ ruled or B1 for $[y =]3x + 2$ soi or $y = 3x + k$ ruled or $y = 3x + 2$ but not $y =$	

Juestion	Answer	Marks	AO Element	Notes	Guidance
1(a)	$\begin{pmatrix} 2\\4 \end{pmatrix}$ cao	1			
1(b)	4.47 or 4.472	2		$\frac{\mathbf{M1} \text{ for}}{(their 2)^2 + (their 4^2)}$	
1(c)	(7, 10)	2		B1 for each	
1(d)	y = 2x - 4 oe	3		M1 for gradient = $\frac{6-2}{5-3}$ oe or answer $y = mx - 4$ M1 for substituting (3, 2) or (5, 6) into $y = their mx + c$ or into $y - k = their m(x - h)$ or into their $y = mx - 4$	
1(e)	(0, -4)	1		FT their (d)	

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