



## Unit 1 Revision Sheet C Graphs Higher

**Note:** Higher tier students must also revise using the foundation tier revision worksheets as this content can also be assessed on higher tier papers.

### Questions

**Q1.**

The straight line **L** passes through the points  $(4, -1)$  and  $(6, 4)$

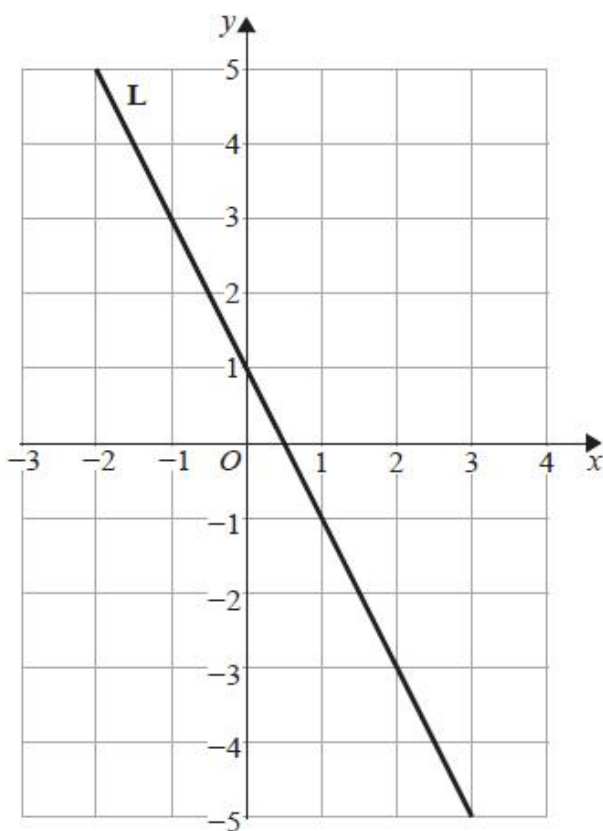
The straight line **M** is perpendicular to **L** and intersects the  $y$ -axis at the point  $(0, 8)$

Find the coordinates of the point where **M** intersects the  $x$ -axis.

(Total for question = 4 marks)

**Q2.**

Here is the straight line **L** drawn on a grid.



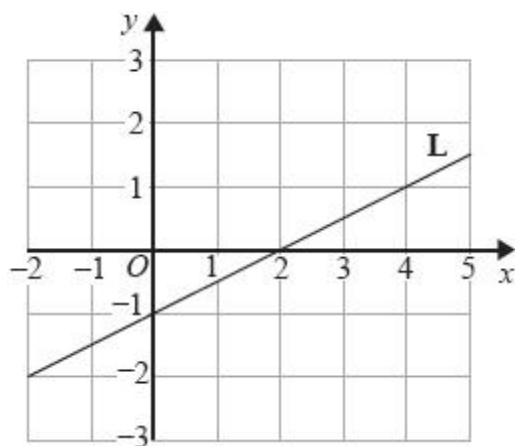
Find an equation for **L**.

(Total for question = 2 marks)



**Q3.**

The straight line **L** is shown on the grid.



(a) Find an equation of **L**.

(2)

(b) Find an equation of the line that is parallel to **L** and passes through the point (5, 4)

(2)

**(Total for question = 4 marks)**

**Q4.**

The points (1, -1) and (4, 7) lie on the straight line **L**.

Find an equation for **L**.

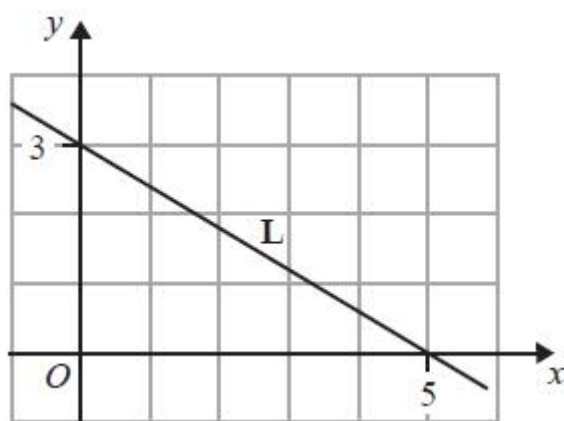
Give your equation in the form  $ax + by = c$  where  $a$ ,  $b$  and  $c$  are integers.

**(Total for question = 4 marks)**



**Q5.**

The straight line **L** is shown on the grid.



Find an equation of **L**.

**(Total for question = 3 marks)**

**Q6.**

The straight line **L** has equation  $3x - 2y = 15$

(a) Find the gradient of **L**.

**(3)**

(b) Find the coordinates of the point where **L** crosses the  $y$ -axis.

**(1)**

(c) Find an equation of the line that is parallel to **L** and crosses the  $x$ -axis at  $(-2, 0)$

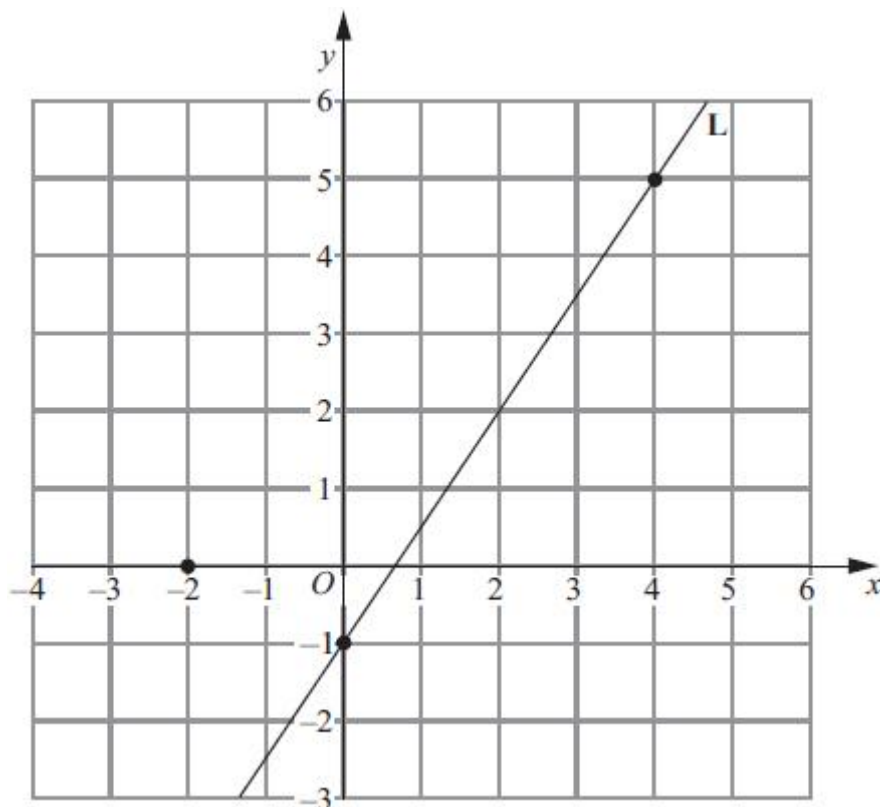
**(2)**

**(Total for question = 6 marks)**



**Q7.**

The points  $(0, -1)$  and  $(4, 5)$  lie on the straight line **L**.



- (a) Work out the gradient of **L**. (2)
- (b) Write down an equation of **L**. (1)
- (c) Find an equation of the line which is parallel to **L** and passes through the point  $(-2, 0)$  (2)

**(Total for question = 5 marks)**

**Q8.**

Line **A** has equation  $3x - 4y = 5$

Line **B** goes through the points  $(4, 7)$  and  $(-1, 3)$

Are lines **A** and **B** parallel?  
Show your working clearly.

**(Total for question = 4 marks)**



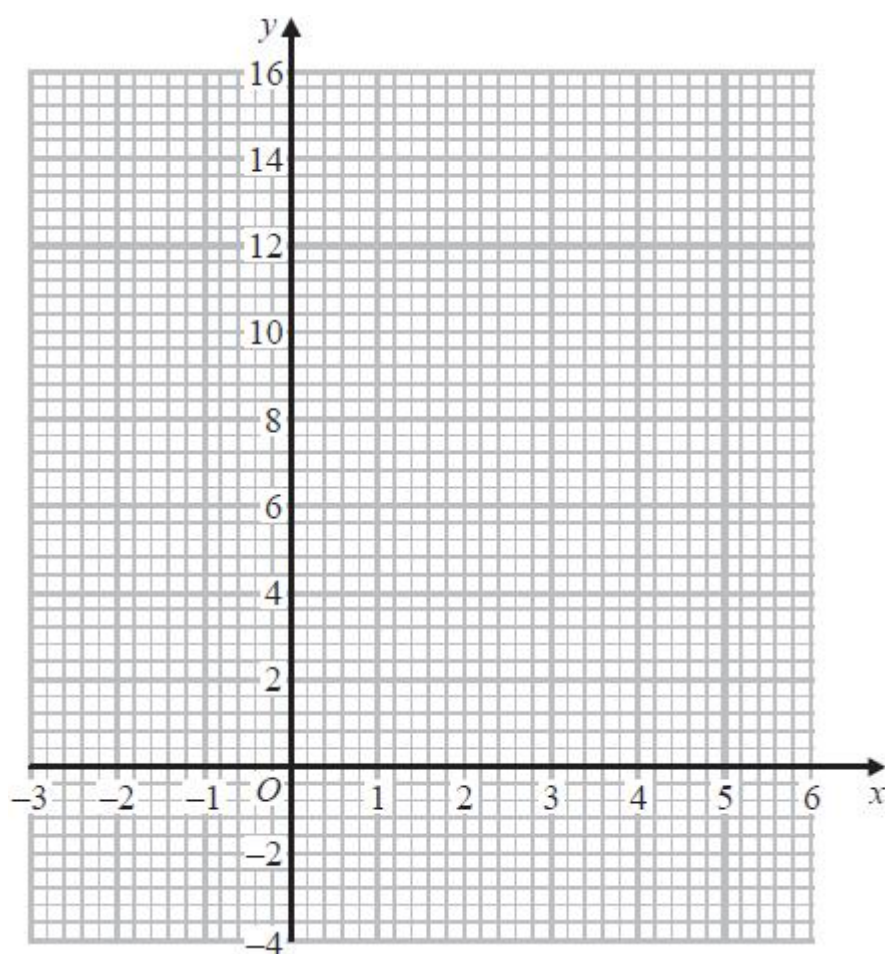
**Q9.**

(a) Complete the table of values for  $y = x^2 - 4x + 2$

$x$	-2	-1	0	1	2	3	4	5
$y$	14		2			-1	2	

(2)

(b) On the grid, draw the graph of  $y = x^2 - 4x + 2$  for values of  $x$  from -2 to 5



(2)

The point  $P(k, 4)$  where  $k > 0$  lies on the graph of  $y = x^2 - 4x + 2$

(c) Use your graph to find an estimate for the value of  $k$ .

(1)

**(Total for question = 5 marks)**



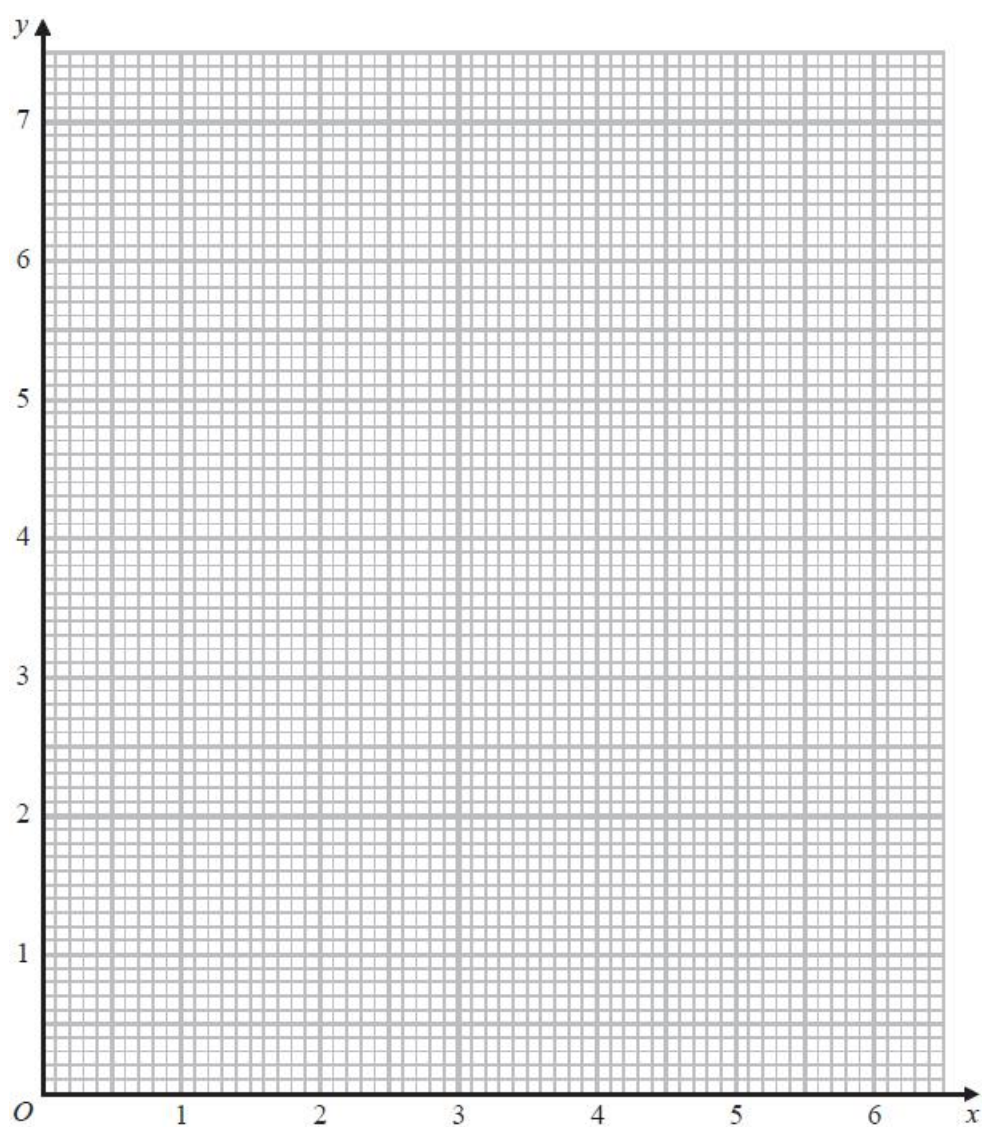
Q10.

(a) Complete the table of values for  $y = \frac{1}{2}\left(x + \frac{9}{x}\right)$

$x$	1	1.5	2	3	4	5	6
$y$	5		3.25		3.125	3.4	

(2)

(b) Draw the graph of  $y = \frac{1}{2}\left(x + \frac{9}{x}\right)$  for values of  $x$  from 1 to 6



(2)



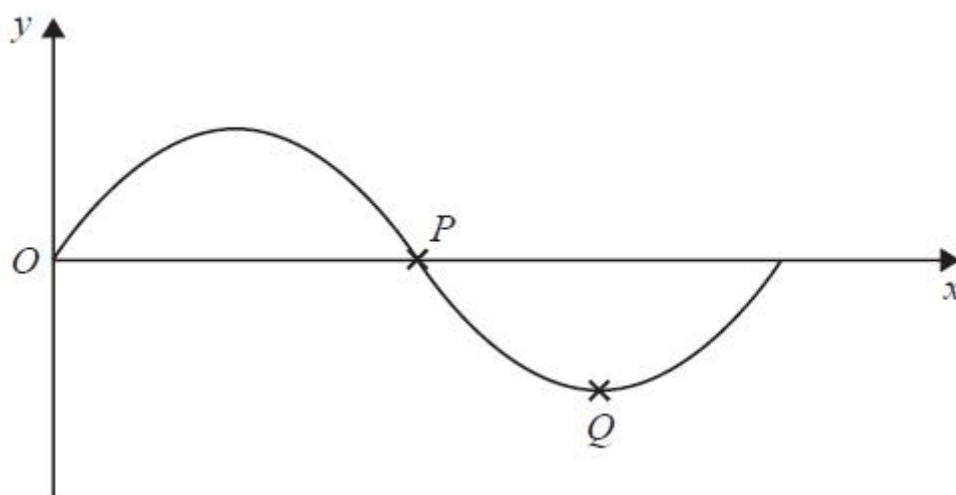
(c) Use the graph to find estimates for the solutions of the equation  $x + \frac{9}{x} = 7$

(2)

(Total for question = 6 marks)

**Q11.**

The diagram shows part of a sketch of the curve  $y = \sin x^\circ$



(a) Write down the coordinates of

- (i) the point  $P$
- (ii) the point  $Q$

(2)

(b) Sketch the graph of  $y = \tan x$  for  $0^\circ \leq x \leq 360^\circ$

Show the coordinates of any points of intersection with the coordinate axes.



(2)

(Total for question = 4 marks)



## Mark Scheme

Q1.

Q	Working	Answer	Mark	Notes
	eg $\frac{4-(-1)}{6-4} (= \frac{5}{2} = 2.5)$		4	M1 for a method to find the gradient of L
	eg $\frac{-1}{2.5} (= -\frac{2}{5} = -0.4)$ or $\frac{-1}{\text{their gradient}}$ oe			M1 fit for a method to find the gradient of M if <i>their</i> gradient of L clearly stated (even if no method shown for gradient of L)
	$y = -0.4x + 8$ oe eg $y - 8 = -\frac{2}{5}(x - 0)$ or $(8 \div 2) \times 5 (= 20)$ oe or $8 \div (-\text{their gradient of M})$			M1 dep on previous M1 for substitution of (0, 8) into equation for a line or use of $(8 \div 2) \times 5 (= 20)$ (maybe on diagram)  NB: 20 gains M3 if clearly intended as x coordinate (stated or on a diagram)
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	(20, 0)		A1
				<b>Total 4 marks</b>

Q2.

Question	Working	Answer	Mark	Notes
		$y = -2x + 1$	2	M1 For $y = -2x + c$ ( $c \neq 1$ ) or $y = mx + 1$ or for a correct method to find the gradient or $m = -2$ and $c = 1$ stated A1 or $-2x + 1$ or $L = -2x + 1$ oe
				<b>Total 2 marks</b>





Q3.

Q	Working	Answer	Mark	Notes	
(a)			2	M1	For $(y=) \frac{3}{6}x + c$ (c may be any number or letter) or For $(y=)mx - 1$ where $m$ is non-zero or for Gradient = $\frac{3}{6}$ oe or $m = \frac{3}{6}$ oe clearly stated
		$y = \frac{1}{2}x - 1$ oe		A1	For a fully a correct equation for L E.g. $y = \frac{3}{6}x - 1$ or $2y = x - 2$ or $y - 1 = \frac{1}{2}(x - 4)$ or $y - -2 = \frac{1}{2}(x - -2)$ M1A0 for $L = \frac{1}{2}x - 1$ or $\frac{1}{2}x - 1$
(b)	$4 = \frac{1}{2} \times 5 + c$ or $y - 4 = \frac{1}{2}(x - 5)$		2	M1ft	For correct substitution of given coordinate into their equation Follow through their gradient in (a)
		$y = \frac{1}{2}x + 1\frac{1}{2}$		A1	oe E.g. $y = \frac{1}{2}(x + 3)$ SCB1 for $(l=) \frac{1}{2}x + 1\frac{1}{2}$
					<b>Total 4 marks</b>



Q4.

Q	Working	Answer	Mark	Notes
	$\frac{7-1}{4-1} \left( = \frac{8}{3} \right)$			M1 for a method to find gradient
	e.g. $7 = \frac{8}{3} \times 4 + c$ or $y$ $-7 = \frac{8}{3}(x-4)$ $c = -\frac{11}{3}$			M1 for a method to find $c$
	$y = \frac{8}{3}x - \frac{11}{3}$			M1 dep on M2
		$8x - 3y = 11$ oe	4	A1
				<b>Total 4 marks</b>

Q5.

The correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.

Question	Working	Answer	Mark	Notes
	(Gradient =) $-\frac{3}{5}$ or ( $m =$ ) $-\frac{3}{5}$			M1 Allow (gradient or $m$ ) = $\frac{3}{5}$ or ( $y =$ ) $-\frac{3}{5}x + c$ ( $c$ may be a number)
				M1 Indep ( $y =$ ) $mx + 3$ ( $m$ may be a number except 0) Allow $y$ intercept or $c = 3$ stated
		$y = -\frac{3}{5}x + 3$ oe		A1 oe Eg Accept $5y + 3x = 15$ or $y - 3 = -\frac{3}{5}(x - 0)$ or $y - 0 = -\frac{3}{5}(x - 5)$
			3	SC B2 for $-\frac{3}{5}x + 3$ or $L = -\frac{3}{5}x + 3$
				<b>Total 3 marks</b>



**Q6.**

Question	Working	Answer	Mark	Notes
(a)	$2y = 3x - 15$ or $-2y = 15 - 3x$ or $1.5x - y = 7.5$		3	M1 Or for finding the coordinates of two correct points that lie on the line
	$y = 1.5x - 7.5$ or $y = \frac{3x - 15}{2}$ or $y = \frac{15 - 3x}{-2}$ oe			M1 or <u>difference of y values</u> or <u>difference of x values</u> for any two correct points on the line
		1.5		A1 oe Do not penalise a mistake in the constant term if the correct answer is given. SCB2 for 1.5x SCB1 ft from their $y = ax + b$
(b)		(0, -7.5)	1	B1 oe
(c)	$0 = 1.5 \times -2 + c$ or $3 \times -2 = k$ or $y - 0 = 1.5(x - -2)$		2	M1 ft 1.5 from (a) or $c = 3$
		$y = 1.5x + 3$		A1 ft 1.5 from (a) or $3x - 2y = -6$ or $y = 1.5(x + 2)$ oe
				<b>Total 6 marks</b>



Q7.

Q	Working	Answer	Mark	Notes
(a)	Correct $v \div h$	1.5 oe	2	M1 e.g. $6 \div 4$ A1 accept improper fractions (e.g. $3/2$ )  N.B. $1.5x = M1A0$
(b)		$y = "1.5"x - 1$ oe	1	B1 ft from (a)
(c)	$y = "1.5"x + c$ oe or $"1.5"x + 3$ or $0 = -2x$ gradient from (a) + c	$y = "1.5"x + "c"$ oe	2	M1ft from (a) $c \neq -1$ (c must be a numeric value) (substituting $y = 0$ and $x = -2$ into $y = mx + c$ ) A1ft "c" = follow through using numeric value of gradient in (a)
				<b>Total 5 marks</b>

Q8.

Question	Working	Answer	Mark	Notes
	$-4y = 5 - 3x$	No with correct figures	4	M1 isolates term in $y$
	$y = 0.75x (+ c)$ or gradient of A = 0.75 oe			M1
	gradient of B = $\frac{3-7}{-1-4} \left( = \frac{4}{5} \right)$ oe			M1 or $y = 0.8x (+ c)$ oe
				A1 eg. No gradient of A = 0.75 but gradient of B = 0.8 oe
				<b>Total 4 marks</b>



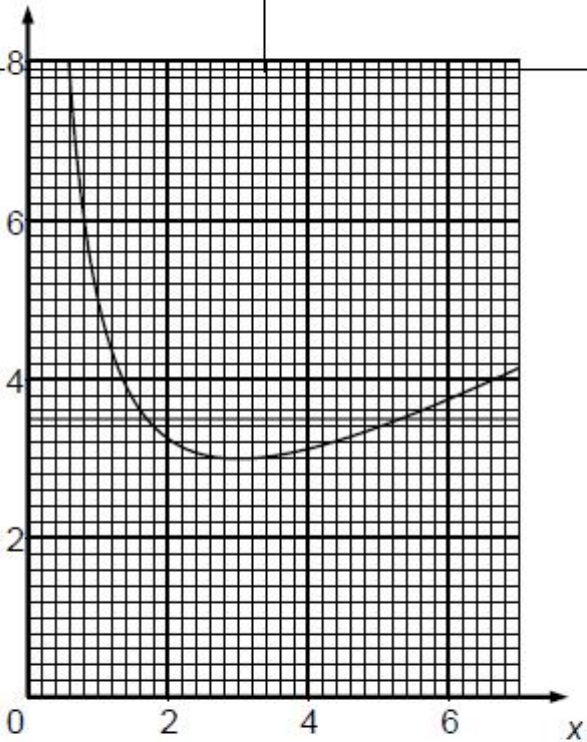
Q9.

Ques		Working	Answer	Mark	Notes	
	a		7, -1, -2, 7	2	B2 B1	all correct for 2 or 3 correct
	b		Correct curve	2	M1 A1	for plotting at least 6 points correctly from their table (dep on B1 earned in (a)) fully correct curve
	c		4.4 – 4.5	1	B1	fit any parabola with 2 intersections with $y = 4$ , 1 value for $x$ only. Condone eg (4.4, 4)
					<b>Total 5 marks</b>	



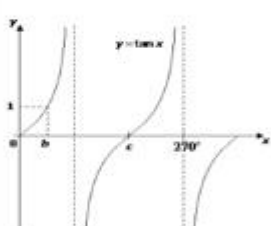
**Q10.**

The correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.

Question		Working				Answer	Mark	Notes								
	(a)	<table border="1"><tr><td><math>x</math></td><td>1.5</td><td>3</td><td>6</td></tr><tr><td><math>y</math></td><td>3.75</td><td>3</td><td>3.75</td></tr></table>	$x$	1.5	3	6	$y$	3.75	3	3.75					2	B2 all 3 correct If not B2 then B1 for 2 correct
$x$	1.5	3	6													
$y$	3.75	3	3.75													
	(b)					Graph	2	M1(ft if at least B1 scored in (a)) for at least 5 points plotted correctly $\pm \frac{1}{2}$ square A1 for correct curve between $x = 1$ and $x = 6$								
	(c)	$y = 3.5$ drawn					2	M1								
						1.7, 5.3		A1 ft graph which gives at least 2 roots <b>NB: Sight of just one correct solution with no method shown gets M0 A0</b>								
Total 6 marks																



Q11.

Q		Working	Answer	Mark	Notes		
	(a)(i)		(180, 0)	4	B1		
	(ii)		(270, -1)		B1		
	(b)				M1		Correct shape curve
			A1		Correct intersections of 0°, 180° and 360° with x axis		
					<b>Total 4 marks</b>		