9 (a) Complete the table of values for

$$y = \frac{x^3 + 4}{5 - x}$$

giving your answers to 2 decimal places.

x	-2	-1.5	-1	-0.5	0	0.5	1	1.5	2
у	-0.57	0.10	0.5		0.8		1.25		4

(2)

(b) On the grid opposite, draw the graph of

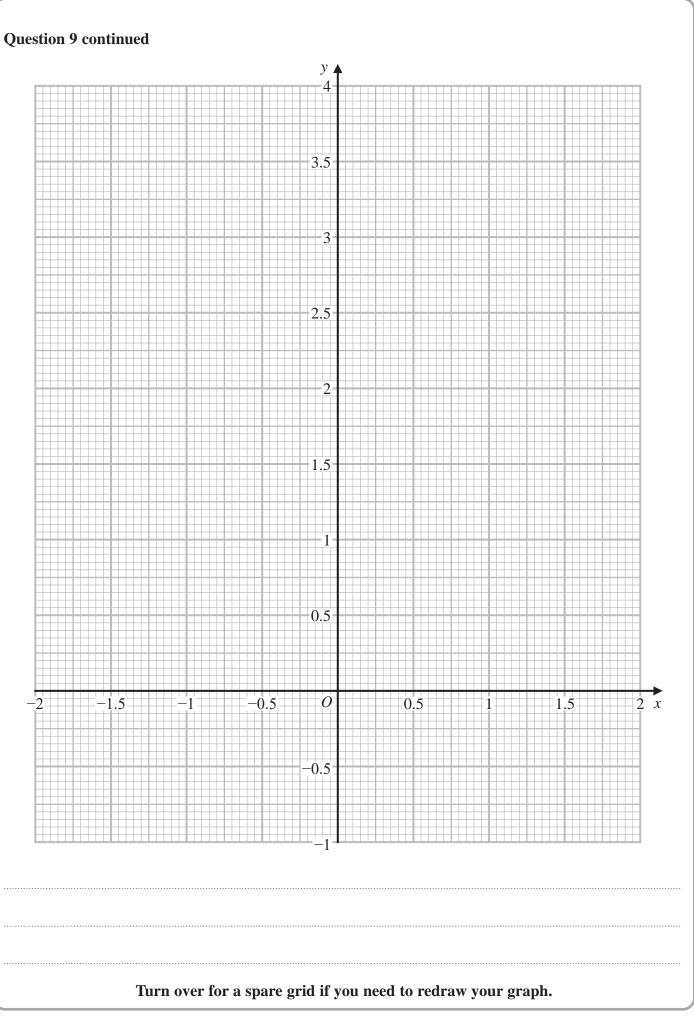
$$y = \frac{x^3 + 4}{5 - x} \qquad \text{for } -2 \leqslant x \leqslant 2$$

(2)

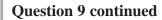
(c) By drawing a suitable straight line on the grid, obtain an estimate, to one decimal place, of the root of the equation  $x^3 - x^2 + 8x - 11 = 0$  in the interval  $-2 \le x \le 2$ 

(5)

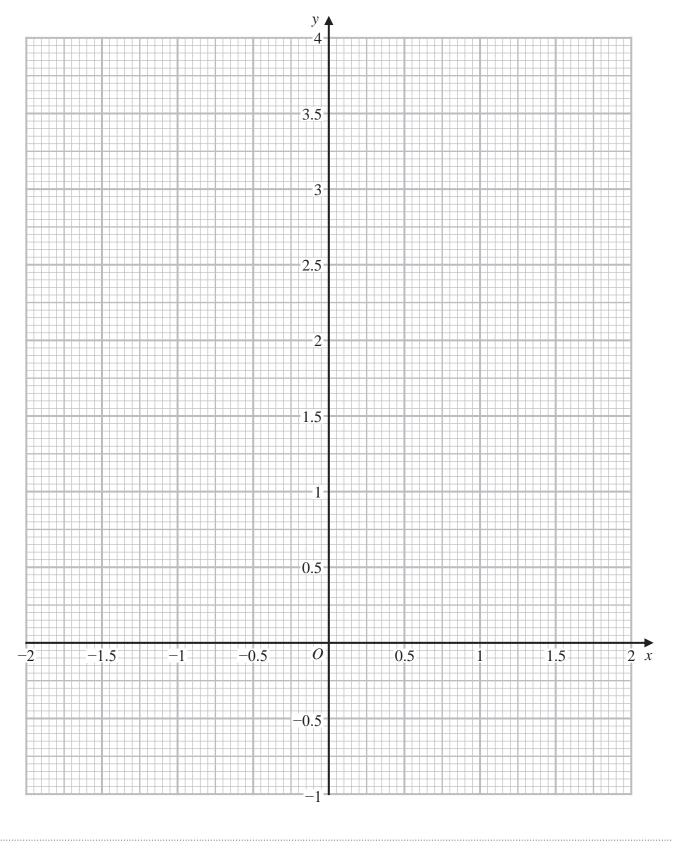
• • • •
• • • •
• • • •
• • • •



Question 9 continued	



Only use this grid if you need to redraw your graph.



(Total for Question 9 is 9 marks)



10 (a) Use the factor theorem to show that (4x - 3) is a factor of

$$16x^3 + 11x - 15$$

(2)

- (b) Using formulae given on page 2, show that
  - (i)  $\sin 2\theta = 2\sin\theta\cos\theta$
  - (ii)  $\cos 2\theta = 2\cos^2 \theta 1$

(5)

(c) Show that the equation

$$27\cos\theta\cos2\theta + 19\sin\theta\sin2\theta - 15 = 0$$

becomes the equation

$$16x^3 + 11x - 15 = 0$$

by using the substitution  $x = \cos \theta$ 

(4)

(d) Hence show that any solution of the equation

$$27\cos\theta\cos2\theta + 19\sin\theta\sin2\theta - 15 = 0$$

is given by  $\cos \theta = \frac{3}{4}$ 

**(4)** 

 	 	 	• • • • • • • • • • • • • • • • • • • •	 	 	 	 
 	 	 	•••••	 	 	 	 

	Question 10 continued
HIS AREA	
NOT WRITE IN T	
NO NOT W	
THIS AREA	
WRITEAN	
DO NOT	
ď.	
OO NOT WRITE IN THIS AREA	
WRITEIN	
DO NOT	



$\times \times \times$	$\sim$
^///	$\triangle \triangle$
$\times \times \times \times$	$\times \times$
$\times$	KX2
$\times$	$\sim$
$\times \times =$	$\times \times$
$\times \times \times \times$	XX
$\sim$	$\sim$
$\infty$	$\infty$
$\times \times \times \times$	$\sim$
$\times \times \Sigma =$	XX
	$\sim$
XX	$\langle \times \rangle$
50.00	
$\times$	XX
$\times \times \times \times$	
$\sim$	$\sim$
$\times \times \times$	$\sim$
$\times \times \times \times$	IXX.
$\times \times \times$	XX
$\times$	$\times \times$
$\times \times \times \times$	$\sim$
2000	$\infty$
	XX
	$\sim$
$\infty$	
$\times \times \times \times \times$	
$\times \times$ $\times$ $\times$	XX
	$\sim$
$\times \times \times$	
××	XX
$\times \times \times \times$	XX
$\sim$	$\sim$
$\times \times \times$	KX)
	$\triangle$
××××	XX
XXXX	$\times \times$
XX	$\times$
	$\sim$
$\infty$	$\infty$
	ĽΧ
$\times \times \times \times$	$\times\!\!\times$
	$\times$
XX	$\sim$
XX	$\sim$
	$\times \times$
DO NOT WRITE IN THIS AREA	$\times\!\!\times$
	W
	$\sim$
XXX =	XX.
XX	XX
$\times\!\!\times\!\!\times$	$\sim$
$\infty$	$\sim$
$\times$	$\sim$
$\times \times \times \times$	$\times \times$
$\sim\sim$	$\sim$
$\times \times \times$	$\sim$
$\infty \infty$	$\circ$
$\times \times \times \times$	$\times$
$\times \times \times \times$	$\times \times$
	$\sim$
	$\propto$
$\sim\sim$	$\sim$
$\times \times \times \times$	$\times \times$
$\times\!\!\times\!\!\times\!\!\times$	XX
	$\sim$
$\times$	
$\times\!\!\times\!\!\times$	$\sim$
	28
	$\otimes$
	$\otimes$
	$\otimes$
	<b>※</b>
	× ×
	× ×
	***
	× × ×
D	
0.0	
00	
00	
100	
NOW	
NOG	
DONG	
DONO	
DONO	
EDINOG	
TONOG	
FON OC	
ALONOG	
M LONOG	
M FON OG	
IM LON OG	
DO NOT WR	
DO NOT WE	
DO NOT WRI	
DO NOT WRIT	
DO NOT WRITE	
DO NOT WRITE!	
DO NOT WRITE IN	
DO NOT WRITE IN	
DO NOT WRITE IN	
DO NOT WRITEIN	
DO NOT WRITE IN T	
DO NOT WRITE IN TI	
DO NOT WRITE IN TH	
DO NOT WRITEIN TH	
DO NOT WRITEIN TH	
DO NOT WRITE IN THE	
DO NOT WRITE IN THIS	
DO NOT WRITE IN THIS	
DO NOT WRITEIN THIS	
DO NOT WRITEIN THIS A	
DO NOT WRITEIN THIS A	
DO NOT WRITE IN THIS AF	
DO NOT WRITE IN THIS AR	
DO NOT WRITE IN THIS AR	
DO NOT WRITE IN THIS ARE	
DO NOT WRITEIN THIS ARE.	
DO NOT WRITEIN THIS AREA	
DO NOT WRITE IN THIS AREA	

Question 10 continued

Question 10 continued	
(Tota	al for Question 10 is 15 marks)



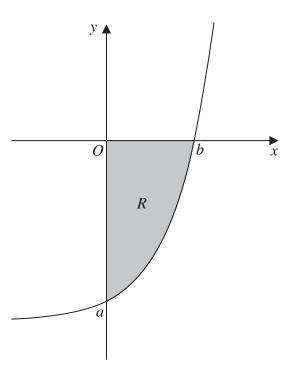


Diagram **NOT** accurately drawn

Figure 3

The finite region R, shown shaded in Figure 3, is bounded by the curve with equation  $y = e^{2x} - 9$  and the coordinate axes.

The curve crosses the coordinate axes at the points with coordinates (0, a) and (b, 0)

- (a) (i) Find the value of a
  - (ii) Show that  $b = \ln 3$

(3)

The region *R* is rotated through  $360^{\circ}$  about the *x*-axis.

(b) Use calculus to find the volume of the solid generated.

Give your answer in the form  $\pi(p \ln 3 + q)$ , where p and q are integers.

ч	- 4	u	٠,


	Question 11 continued
HS AREA	
TE IN TH	
NOT WRITE IN	
N.OQ	
A	
HIS AREA	
WRITEINT	
NOT WR	
DO	
A	
HIS ARE	
SITE IN T	
OO NOT WRITE IN THIS AREA	
DQ	



DO NOT WRITE IN THIS AREA

Question 11 continued	

	Question 11 continued
HS AREA	
SITE IN TH	
O NOT WRITE IN	
ď	
HIS AREA	
WRITEINTH	
NOT WE	
DG	
SAREA	
TE IN THI	
OO NOT WRITE IN THIS AREA	
DQ	



DO NOT WRITE IN THIS AREA

uestion 11 continued	
	(Total for Question 11 is 9 marks)
	TOTAL FOR PAPER IS 100 MARKS

