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Centre No. Surname Initial(s)	·mym	A Math
Candidate No.		
Paper Reference(s) 4400/3H	Examiner's use	only
London Examinations IGCSE	eam Leader's u	se only
Mathematics		
Paper 3H	Page Number	Leave Blank
Higher Tier	4	
Tuesday 2 November 2004 – Morning	5	
Time: 2 hours	6	
	8	
Materials required for examination Ruler graduated in centimetres andItems included with question papers Nil	9	
millimetres, protractor, compasses, pen, HB pencil, eraser, calculator.	10	
Tracing paper may be used.	11	
	12	
nstructions to Candidates	13	
the boxes above, write your centre number and candidate number, your surname, initial(s) and	- 14	
he paper reference is shown at the top of this page. Check that you have the correct question paper.	. 15	
nswer ALL the questions in the spaces provided in this question paper. how all the steps in any calculations.	16	
nformation for Candidates	17	
here are 20 pages in this question paper. All blank pages are indicated.	18	
g. (2).	19	
ou may use a calculator.	20	
Write your answers neatly and in good English.	-	

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TURN OVER FOR QUESTION 1

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Answer ALL TWENTY questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. The diagram shows a map of an island. Two towns, *P* and *Q*, are shown on the map.

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(a) Find the bearing of Q from P.

(2)

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The scale of the map is 1 cm to 5 km.(b) Find the real distance between <i>P</i> and <i>Q</i>.	Inains
	km (2)
Another town, R , is due East of Q . The bearing of R from P is 135°.	
(c) On the map, mark and label R .	(2) Q1
	(Total 6 marks)

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2.	The table sh		ms of a	sequen		 	104
		Term number	1	2	3		
		Term	2	5	10		
	The rule for	this sequence is					
		Term	= (Term	numbe	$(er)^2 + 1$		
	(a) Work o	ut the next two terms	of this s	equenc	e.		
			101			(2)	
	(b) One ter Find the	e term number of this	term.				
						(2)	Q2
						(Total 4 marks)	
3.	(a) Nikos c	trinks $\frac{2}{3}$ of a litre of o	range ju	ice eacl	h day.		
	How m Give yo	any litres does Nikos our answer as a mixed	drink in l number	5 days'	?		
						(2)	
	(b) (i) Fin	d the lowest common	multiple	e of 4 a	nd 6.		
	(ii) Wo Giv	ork out $3\frac{3}{4} + 2\frac{5}{6}$. We your answer as a m	ixed nur	nber.			
	Yo	u must show all your	working				
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4.	Toni buys a car for £2500 and sells it for £2775. Calculate her percentage profit.	athscic
	% (Total 3 marks)	Q4
5.	A straight road rises 60 m in a horizontal distance of 260 m. 60 m Diagram NOT accurately drawn 260 m	
	 (a) Work out the gradient of the road. Give your answer as a fraction in its lowest terms. 	
	m (2) (Total 4 marks)	Q5

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• The diagram shows a circle, centre O. PTQ is the tangent to the circle at T. PO = 6 cm. Angle $OPT = 40^{\circ}$.		nathsclou
6 cm 36° 7 Q	Diagram NOT accurately drawn	
(a) Explain why angle $OTP = 90^{\circ}$.		
(b) Calculate the length of <i>OT</i>. Give your answer correct to 3 significant figures.	(1)	
(c) Angle $QOT = 36^{\circ}$. Calculate the length of OQ . Give your answer correct to 3 significant figures.	cm (3)	
		Q7

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Age (years)	Number of students	
16	9	
1/	3	
18	8	
19	4	
(a) (i) Write d	lown the mode of these ages.	
		vears
		yours
(ii) Find th	e median of these ages.	
		vears
(iii) Calcula	ate the mean of these ages.	
		years
		(6)
Another student	, aged 18, joins the group.	
Another student	, aged 18, joins the group.	whether the mean will increase or
Another student b) (i) Withou decreas	a, aged 18, joins the group. It calculating the new mean, state be or stay the same.	whether the mean will increase or
Another student b) (i) Withou decreas	a, aged 18, joins the group. It calculating the new mean, state se or stay the same.	whether the mean will increase or
Another student b) (i) Withou decreas	a, aged 18, joins the group. At calculating the new mean, state are or stay the same.	whether the mean will increase or
Another student b) (i) Withou decreas (ii) Give a	a, aged 18, joins the group. It calculating the new mean, state se or stay the same. reason for your answer to (i).	whether the mean will increase or
Another student b) (i) Withou decreas (ii) Give a	a, aged 18, joins the group. It calculating the new mean, state se or stay the same. reason for your answer to (i).	whether the mean will increase or
Another student b) (i) Withou decreas (ii) Give a	a, aged 18, joins the group. It calculating the new mean, state se or stay the same. reason for your answer to (i).	whether the mean will increase or
Another student b) (i) Withou decreas (ii) Give a	a, aged 18, joins the group. It calculating the new mean, state se or stay the same. reason for your answer to (i).	whether the mean will increase or

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	Planet	Mean distance		
	Thunot	from the Sun (km)		
	Mercury	5.8×10^{7}		
	Venus	1.1 × 10 ⁸		
	Earth	1.5×10^{8}		
	Mars	2.3×10^{8}		
	Jupiter	7.8×10^{8}		
	Saturn	1.4×10^{9}		
	Uranus	2.9×10^{9}		
	Neptune	4.5×10^{9}		
	Pluto	5.9×10^{9}		
(a) Which plan(b) Find the ra Neptune from	net is approximately 4 ti tio of the mean distanc om the Sun. Give your	mes as far from the Sun as e of Earth from the Sun t answer in the form 1: <i>n</i>	• Mercury? (1) o the mean distance of	
(a) Which plan(b) Find the range of the plane	net is approximately 4 ti tio of the mean distanc om the Sun. Give your	mes as far from the Sun as e of Earth from the Sun t answer in the form 1: <i>n</i>	• Mercury? (1) o the mean distance of	
(a) Which plan(b) Find the ra Neptune from	net is approximately 4 ti atio of the mean distanc om the Sun. Give your	mes as far from the Sun as e of Earth from the Sun t answer in the form 1: <i>n</i>	• Mercury? (1) o the mean distance of	Q10
(a) Which plan(b) Find the raNeptune from	net is approximately 4 ti tio of the mean distanc om the Sun. Give your	mes as far from the Sun as e of Earth from the Sun t answer in the form 1: <i>n</i>	Mercury? (1) o the mean distance of (2) (Total 3 marks)	Q10
 (a) Which plan (b) Find the range of the plane (b) Neptune from the plane 	net is approximately 4 ti atio of the mean distanc om the Sun. Give your	mes as far from the Sun as e of Earth from the Sun t answer in the form 1: <i>n</i>	• Mercury? (1) o the mean distance of (2) (Total 3 marks)	Q10
 (a) Which plan (b) Find the range of the ran	het is approximately 4 ti atio of the mean distanc om the Sun. Give your	mes as far from the Sun as e of Earth from the Sun t answer in the form 1: <i>n</i>	Mercury? (1) to the mean distance of (2) (Total 3 marks)	Q10
 (a) Which plan (b) Find the range of the ran	net is approximately 4 ti atio of the mean distanc om the Sun. Give your	mes as far from the Sun as e of Earth from the Sun t answer in the form 1: <i>n</i>	 Mercury? (1) o the mean distance of 	Q10
 (a) Which plan (b) Find the ra Neptune from 	het is approximately 4 ti atio of the mean distanc om the Sun. Give your	e of Earth from the Sun as answer in the form 1: <i>n</i>	 Mercury? (1) o the mean distance of (2) (Total 3 marks) 	Q10
 (a) Which plan (b) Find the range of the ran	het is approximately 4 ti atio of the mean distanc om the Sun. Give your	e of Earth from the Sun as answer in the form 1: <i>n</i>	 Mercury? (1) o the mean distance of (2) (Total 3 marks) 	Q10

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Sets *A* and *B* are represented by the circles in the Venn diagram.



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A, B, C and D are points on a circle. Angle $BAC = 40^{\circ}$. Angle $DBC = 55^{\circ}$.		mathsci
A 40° B 55° C	Diagram NOT accurately drawn	
(a) (i) Find the size of angle <i>DAC</i> .	٥	
(ii) Give a reason for your answer.		
(b) (i) Calculate the size of angle <i>DCB</i> .	(2)	
(ii) Give reasons for your answer.	o 	
(c) Is <i>BD</i> a diameter of the circle?	(3)	
Give a reason for your answer.		
	(1)	Q12
	(Total 6 marks)	

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3. A bag contains 4 black discs and 5 white discs.		Sthsclou
) (
Ranjit takes a disc at random from the bag and notes its colour.		
He then replaces the disc in the bag. Ranjit takes another disc at random from the bag and notes its colour.		
(a) Complete the probability tree diagram to show all the possibilities.		
First disc Second disc		
Black		
White		
white		
	(4)	
(b) Calculate the probability that Ranjit takes two discs of different colours.		
	(3)	Q13
(Total 7	marks)	

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7. A curve has equation $y = x^2 - 4x + 1$.		mathscie
(a) For this curve find		
(i) $\frac{\mathrm{d}y}{\mathrm{d}x}$,		
(ii) the coordinates of the turning point.		
	(4)	
(b) State, with a reason, whether the turning point is a maximum or a minimum.		
	(2)	
(c) Find the equation of the line of symmetry of the curve $y = x^2 - 4x + 1$		
	(2)	Q17
(Total 8	marks)	

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	$ \begin{array}{c} $		
The volume of the cone is Find an expression for <i>r</i> i	is $12\pi \text{ cm}^3$. in terms of <i>h</i> .		
		r =	018
		(T-4-12 1)	
19. Express $\sqrt{98}$ in the form	$a a \sqrt{b}$ where <i>a</i> and <i>b</i> are integers and	(Total 3 marks) <i>a</i> > 1.	
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19. Express $\sqrt{98}$ in the form	$a a \sqrt{b}$ where <i>a</i> and <i>b</i> are integers and	(Total 3 marks) <i>a</i> > 1. 	Q19
19. Express $\sqrt{98}$ in the form	$a a \sqrt{b}$ where <i>a</i> and <i>b</i> are integers and	(Total 3 marks) <i>a</i> > 1. 	Q19

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0. A box contains 7 good apples and 3 bad apples.	thsclot
Nick takes two apples at random from the box, without replacement.	
(a) (i) Calculate the probability that both of Nick's apples are bad.	
(ii) Calculate the probability that at least one of Nick's apples is good.	
Another box contains 8 good oranges and 4 bad oranges.	
Crystal keeps taking oranges at random from the box one at a time, without replacement, until she gets a good orange.	
(b) Calculate the probability that she takes exactly three oranges.	
(2)	020
(Total 6 marks)	
TOTAL FOR PAPER: 100 MARKS	
END	

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