Centre No.		Paper Reference					Surname	Initial(s)		
Candidate No.		5	5	4	4	/	1	4	Signature	

Paper Reference(s) 5544/14
Edexcel GCSE
2544 Mathematics B
Unit 4 (Terminal)
Paper 14 – Section A (Non-Calculator)
Higher Tier
Practice Paper D
Time: 1 hour 10 minutes

Materials required for examination Items included with question papers

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser. Tracing paper may be used. Formulae sheet.

Instructions to Candidates

In the boxes above, write your Centre Number and Candidate Number, your surname, initial(s) and signature.

Check that you have the correct question paper.

Answer **ALL** the questions in the spaces provided in this question paper. Supplementary answer sheets may be used.

Information for Candidates

The total mark for this paper is 60. The marks for the various parts of questions are shown in round brackets, e.g.: (2). This paper has 18 questions. Calculators may NOT be used.

Advice to Candidates

Work steadily through the paper. Do not spend too long on one question. Show all stages in any calculations. If you cannot answer a question, leave it and attempt the next one. Return at the end to those questions you have left out.





Formulae – Higher Tier You must not write on this formula page. Anything you write on this formulae page will gain NO credit.



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$, where $a \neq 0$, are given by $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Answer ALL EIGHTEEN questions.

Write your answers in the spaces provided.

You must NOT use a calculator.

You must write down all stages in your working.

Jack and Jill share £18 in the ratio 1:5
 Work out how much each person gets.

2.

	Jack £
	Jill £ (Total 2 marks)
Work out $\frac{2}{5} + \frac{3}{8}$	
	(Total 2 marks)



On the grid, rotate the triangle a half turn about the point *O*.

(Total 2 marks)

4. Here are two fractions $\frac{3}{5}$ and $\frac{2}{3}$.

Explain which is the larger fraction.

You may use the grids to help with your explanation.



5. (a) Solve 5x + 3 > 19

n is a whole number such that

 $7 \leq 3n < 15$

(b) List all the possible values of *n*.

(3) (Total 5 marks) 6. The diagrams show some solid shapes and their nets. An arrow has been drawn from one solid shape to its net.

Draw an arrow from each of the other solid shapes to its net.





Diagram NOT accurately drawn

The lengths, in cm, of the sides of the triangle are 3(x - 3), 4x - 1 and 2x + 5

The perimeter of the triangle is 49 cm.

Work out the value of *x*.

x =

(Total 4 marks)

8. A shop sells doughnuts and muffins. Doughnuts cost *d* pence each. Muffins cost *m* pence each.

Daniel buys 4 doughnuts and 3 muffins.

The total cost is *C* pence.

Write down a formula for C in terms of d and m.

(Total 3 marks)

9. The diagram shows a solid object.



(a) In the space below, sketch the front elevation from the direction marked with an arrow.

(2)

(b) In the space below, sketch the plan of the solid object.

		0		

(2) (Total 4 marks)

- 12. A school has 1200 pupils. 575 of these pupils are girls.
 - $\frac{2}{5}$ of the girls like sport.
 - $\frac{3}{5}$ of the boys like sport.

Work out the total number of pupils in the school who like sport.

(Total 4 marks)



(Total 3 marks)

15. $7^5 \times 7^6 = 7^3 \times 7^k$

Find the value of *k*.

Leave blank

(Total 2 marks)

16.



Diagram **NOT** accurately drawn

The diagram shows a solid wooden cone. The height of the cone is 6 cm. The base radius of the cone is 8 cm.

(a) Find the volume of the cone.

Give your answer as a multiple of π .

..... cm³
(2)

The cone is cut once to form a smaller cone and a frustum.



The height of the smaller cone and the height of the frustum are both 3 cm. The base radius of the smaller cone is 4 cm.

(b) Show that the volume of the frustum is 112π cm³.

(2) (Total 4 marks)

17. Work out

$$\frac{(5+\sqrt{3})(5-\sqrt{3})}{\sqrt{22}}$$

Give your answer in its simplest form.

(Total 3 marks)

18. Solve the simultaneous equations

$$x + y = 4$$
$$x^2 + y^2 = 40$$

x =...., *y* =

or

x =...., *y* =

(Total 7 marks)

TOTAL FOR PAPER: 60 MARKS

END

Qu	Working	Answer	Mark	Notes
1	1:5 = 6 parts	3	2	B1 for 3
-	$18 \div 6 = 3$	15		B1 for 15
2	2×8+3×5_16+15	33	2	M1 for $2 \times 8 + 3 \times 5$
	$-\frac{1}{40} = \frac{1}{40}$	$\overline{40}$		$\frac{1}{40} \qquad \qquad$
				A1 for $\frac{33}{3}$ or
				40
3			2	
			2	B2 for correct rotation (D1 for correct orientation incorrect control)
				(B1 for correct orientation, incorrect centre)
4	2 10 and 6666 and a la 10		3	11 + 5 = 2 + 10 = 0.00000000000000000000000000000000
	$\frac{-}{3} = \frac{-}{15}$ or 0.0000 or shade 10	$\frac{-}{3}$ with valid explanation		10^{-10} $\frac{10^{-10}}{3} = \frac{10^{-10}}{15}$ or 0.0000 or shade 10
	3 = 9 or 0.6 or shade 0			M1 for $3-9$ or 0.6 or shade 0
	$\frac{-}{5} = \frac{-}{15}$ of 0.0 of shade 9			$\frac{1}{5}$ $\frac{1}{15}$ $\frac{1}{15}$ $\frac{1}{15}$
				A1 for $\frac{2}{2}$ (dep on M1)
				3
5a	5x > 19 - 3	<i>x</i> > 3.2	2	M1 for $5x > 19 - 3$
	$x > 16 \div 5$			A1 cao
h	7.2 < < 15.2	3 /	3	M_{1} for $7 \div 3$ or $15 \div 3$ or
U	$7-3 \le n < 13-3$	5, 4	5	A2 for 3 and 4
				(A1 for 2, 3, 4 or 3, 4, 5 or $7 \div 3 \le n \le 5$
6		1 2 3 (4) 5	3	B3
		4 3 5 (2) 1		
				(B2 for 2 or 3 correct0
		-		(B1 for 1 correct)
7	3(x-3) + 4x - 1 + 2x + 5 = 49	6		M1 for " $3(x-3)$ " + 4x - 1 + 2x + 5 oe
	9x - 5 = 49			NI1 IOF $3(x-3)^{2} + 4x - 1 + 2x + 5$ oe = 49
			1	AI Cau

2544 Unit 4 Higher Practice Paper D (Section A – Non-Calculator) Mark Scheme

Edexcel GCSE Modular Mathematics 2544 Unit 4 Higher tier Practice Paper D (Section A – Non-Calculator)

8		C = 4d + 3m	3	B3
				(B2 for $4d + 3m$ oe)
				(B1 for 4 <i>d</i> oe or 3 <i>m</i> oe or C = linear expression in <i>m</i> and <i>d</i>
9a			2	B2
				(B1 for any trapezium or 3 by 1 rectangle)
				D0
h			2	B2 (B1 for correct plan with 1, 2 or 3 squares missing)
U			2	(B) for concer plan with 1, 2 or 5 squares missing)
10a		Bryony + explanation	2	B1 for Bryony
				B1 for valid explanation (eg square first)
b	$2(3+1)^2 = 2(4)^2 = 2 \times 16$	32	2	M1 for $2(3+1)^2$ oe
				A1 cao
11	$48 - (4 \times 5) = 28$	7	3	M1 for 4×5 or 20 seen
	$28 \div 4$			M1 for $48 - (4 \times 5) \div 4$
				A1 cao
12	$\frac{2}{5} \times 575 + \frac{3}{5} \times (1200 - 575)$	605	4	M1 for $\frac{2}{5} \times 575$ or $\frac{3}{5} \times (1200 - 575)$ oe
	$= 2 \times 115 + 3 \times 125$ = 230 + 375			A1 for 230 or 375 seen
	- 250 + 575			M1 for $"230" + "375"$
				A1 cao
13		rotation 90° anticlockwise	3	B3 (accept 270° clockwise)
		centre (0, 0)		
				(B2 for all but missing 90° anticlockwise or centre $(0, 0)$)
				(B1 for rotation)
14	(i)	(x-4)(x-3)	3	B2 for $(x-4)(x-3)$
				(B1 for $(x \pm 4)(x \pm 3)$)
	(ii)	4 or 3		B1 f.t. for 3 and 4 (dep on B1 above)
15	$7^{0+3} = 7^{3+k}, 7^{11} = 7^{3+k}$	8	2	M1 for $7^{b+5} = 7^{3+k}$ oe
	11 = 3 + k			A1 cao

16a	$1/3 \pi (8)^{2}(6)$	128π	2	M1 for $1/3 \pi (8)^2(6)$
b	Radius of top cone is 4 cm Vol = $128\pi - \frac{1}{2}\pi(4)^2(3)$ = $128\pi - 16\pi = 112\pi$	Proof	2	A1 cao B1 for radius of top cone = 4 cm B1 for vol = = "128" $\pi - \frac{1}{2} \pi$ ("4") ² (3)
17	$\frac{(5+\sqrt{3})(5-\sqrt{3})}{\sqrt{22}} = \frac{25-3}{\sqrt{22}}$ $= \frac{22}{\sqrt{22}} \times \frac{\sqrt{22}}{\sqrt{22}} = \frac{22\sqrt{22}}{22}$	$\sqrt{22}$	3	B1 for numerator = 25 – 3 or 22 B1 (indep) for attempting to rationalise denominator B1 cao
18	x = 4 - y $(4 - y)^{2} + y^{2} = 40$ $16 - 8y + y^{2} + y^{2} = 40$ $2y^{2} - 8y + 16 - 40 = 0$ $y^{2} - 4y - 12 = 0$ (y - 6)(y + 2) = 0 y = 6 or -2 x = 4 - 6 or 42	x = 6, y = -2 or x = -2, y = 6	7	B1 for $x = 4 - y$ or $y = 4 - x$ M1 for substituting for his x or y in $x^2 + y^2 = 40$ M1 for expanding and obtaining a quadratic = 0 M1 for factorising correctly A1 for $x = 6$ and -2 or $y = 6$ or -2 cao M1 for substituting to find other values A1 f.t. for " $x = 6$ and -2 " or " $y = 6$ or -2 "