

Centre No.						Paper Reference						Surname	Initial(s)	
Candidate No.						5	5	3	8	/	1	9	Signature	

Paper Reference(s)

5538/19

Edexcel GCSE

Mathematics B – 1388

Paper 19 (Calculator)

Higher Tier

Monday 12 June 2006 – Morning

Time: 1 hour 15 minutes

Examiner's use only

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Team Leader's use only

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Materials required for examination

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

Items included with question papers

Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature. Check that you have the correct question paper.

Answer ALL the questions in the spaces provided in this question paper.

You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.

If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2).

There are 17 questions in this question paper. The total mark for this paper is 62.

There are 16 pages in this question paper. Any blank pages are indicated.

Calculators may be used.

If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Advice to Candidates

Show all stages in any calculations.

Work steadily through the paper. Do not spend too long on one question.

If you cannot answer a question, leave it and attempt the next one.

Return at the end to those you have left out.

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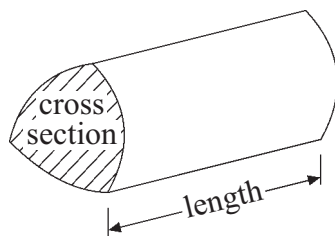
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GCSE Mathematics 1387/8

Formulae: Higher Tier

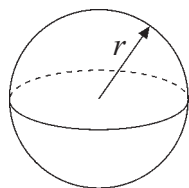
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section \times length



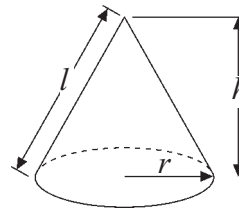
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$

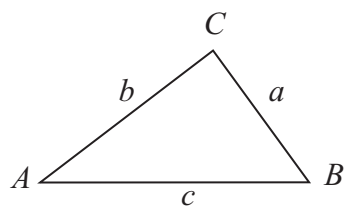


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



In any triangle ABC



Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2}ab \sin C$

The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$

where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$





<p style="text-align: center;">Answer ALL SEVENTEEN questions.</p> <p style="text-align: center;">Write your answers in the spaces provided.</p> <p style="text-align: center;">You must write down all stages in your working.</p> <p>1. Amy, Beth and Colin share 36 sweets in the ratio 2 : 3 : 4</p> <p>Work out the number of sweets that each of them receives.</p> <p style="text-align: right;">Amy sweets</p> <p style="text-align: right;">Beth sweets</p> <p style="text-align: right;">Colin sweets</p> <p style="text-align: right;">(Total 3 marks)</p>	<p>Leave blank</p> <p>Q1</p> <div></div>
<p>2. Sophie says ‘For any whole number, n, the value of $6n - 1$ is always a prime number’.</p> <p>Sophie is wrong.</p> <p>Give an example to show that Sophie is wrong.</p> <p style="text-align: right;">(Total 2 marks)</p>	<p>Q2</p> <div></div>



N 2 2 5 8 0 A 0 3 1 6



<p>3. (a) Simplify</p> <p>(i) $x^4 \times x^5$</p> <p>.....</p> <p>(ii) $\frac{p^8}{p^3}$</p> <p>.....</p> <p>(iii) $3s^2t^3 \times 4s^4t^2$</p> <p>.....</p> <p>(iv) $(q^3)^4$</p> <p>.....</p> <p style="text-align: right;">(5)</p> <p>(b) Expand $2d(d + 3)$</p> <p>.....</p> <p style="text-align: right;">(2)</p> <p style="text-align: right;">(Total 7 marks)</p>	<p>Leave blank</p> <p>Q3</p> <div></div>
<p>4. Work out $\frac{\sqrt{2.56 + \sin 57^\circ}}{8.765 - 6.78}$</p> <p>(a) Write down all the figures on your calculator display.</p> <p>.....</p> <p style="text-align: right;">(2)</p> <p>(b) Give your answer to part (a) to an appropriate degree of accuracy.</p> <p>.....</p> <p style="text-align: right;">(1)</p> <p style="text-align: right;">(Total 3 marks)</p>	<p>Q4</p> <div></div>



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5. Jim makes a model of his school.

He uses a scale of 1 : 50

The area of the door on his model is 8 cm².

Work out the area of the door on the real school.

..... cm²

(Total 2 marks)

Q5

6. The table shows some expressions.

p , q and r represent lengths.

π , 2, 3 and 4 are values that have no dimension.

Place a tick (✓) in the appropriate column for each expression to show whether the expression can be used to represent a length, an area, a volume or none of these.

Expression	Length	Area	Volume	None of these
$3pqr$				
$4p + 2q$				
πr^2				

(Total 3 marks)

Q6



7. The first four terms of an arithmetic sequence are

7 13 19 25

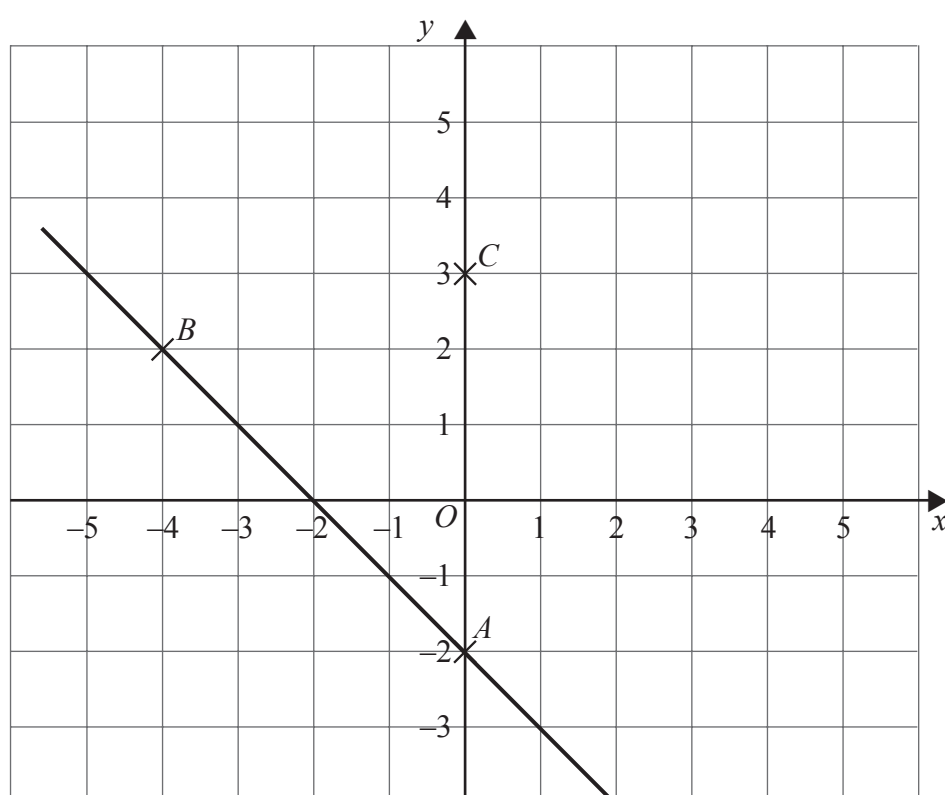
Find an expression, in terms of n , for the n th term of this sequence.

Leave
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Q7

(Total 2 marks)

8.



In the diagram A is the point $(0, -2)$,
 B is the point $(-4, 2)$,
 C is the point $(0, 3)$.

Find an equation of the line that passes through C and is parallel to AB .

Q8

(Total 4 marks)





<p>9. Calculate the length of the side marked x in this right-angled triangle. Give your answer correct to 3 significant figures.</p> <div data-bbox="667 715 1073 1026"></div> <p>Diagram NOT accurately drawn</p> <p>..... cm</p> <p>(Total 3 marks)</p>	<p>Leave blank</p> <p>Q9</p> <div></div>
<p>10. Expand and simplify $(2x + 5)(3x - 2)$</p> <p>.....</p> <p>(Total 2 marks)</p>	<p>Q10</p> <div></div>



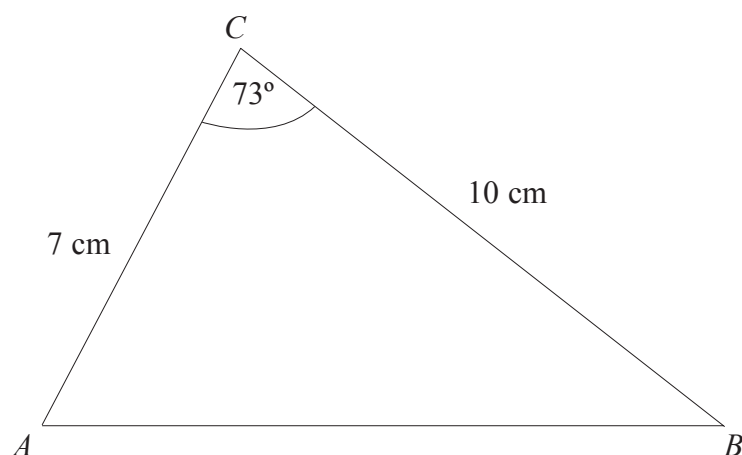
N 2 2 5 8 0 A 0 7 1 6



11.

Diagram **NOT**
accurately drawn

Leave
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In triangle ABC ,
 $AC = 7$ cm,
 $BC = 10$ cm,
angle $ACB = 73^\circ$.

Calculate the length of AB .
Give your answer correct to 3 significant figures.

..... cm

Q11

(Total 3 marks)



Q12

The probability that Simon will win at tennis is $\frac{3}{4}$
 The probability that Simon will win at snooker is $\frac{1}{3}$

tennis

$\frac{3}{4}$ Simon wins

$\frac{1}{4}$ Simon does not win

snooker

$\frac{1}{3}$ Simon wins

$\frac{2}{3}$ Simon does not win

$\frac{1}{2}$ Simon wins

$\frac{1}{2}$ Simon does not win

(b) Work out the probability that Simon wins both games.

(2)

(c) Work out the probability that Simon will win only one game.

(3)

N 2 2 5 8 0 A 0 9 1 6

<p>13. The length of a rectangle is 6.7 cm, correct to 2 significant figures.</p> <p>(a) For the length of the rectangle write down</p> <p>(i) the upper bound,</p> <p>..... cm</p> <p>(ii) the lower bound.</p> <p>..... cm</p> <p>(2)</p> <p>The area of the rectangle is 26.9 cm², correct to 3 significant figures.</p> <p>(b) (i) Calculate the upper bound for the width of the rectangle. Write down all the figures on your calculator display.</p> <p>..... cm</p> <p>(ii) Calculate the lower bound for the width of the rectangle. Write down all the figures on your calculator display.</p> <p>..... cm</p> <p>(3)</p> <p>(c) Write down the width of the rectangle to an appropriate degree of accuracy.</p> <p>..... cm</p> <p>(1)</p> <p>(Total 6 marks)</p>	<p>Leave blank</p> <p>Q13</p>



14.

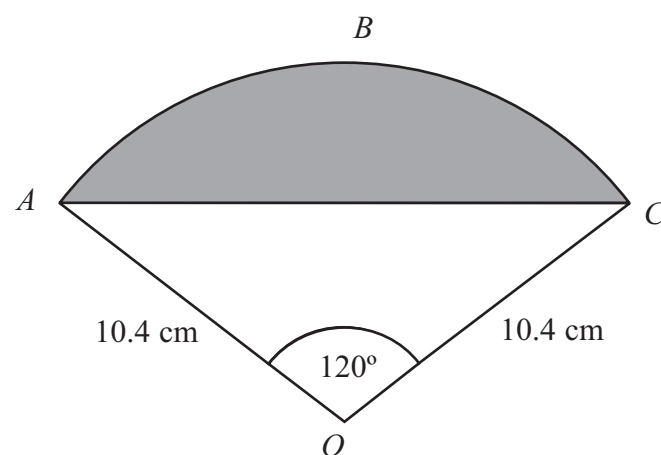


Diagram **NOT**
accurately drawn

The diagram shows a sector $OABC$ of a circle with centre O .
 $OA = OC = 10.4$ cm.
 Angle $AOC = 120^\circ$.

Calculate the area of the shaded segment ABC .
 Give your answer correct to 3 significant figures.

..... cm²

(Total 4 marks)

Leave
blank

Q14



15. The table gives information about the number of girls in each of four schools.

School	A	B	C	D	Total
Number of girls	126	82	201	52	461

Jenny did a survey of these girls.
She used a stratified sample of exactly 80 girls according to school.

Work out the number of girls from each school that were in her sample of 80.
Complete the table.

School	A	B	C	D	Total
Number of girls					80

Leave
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Q15

(Total 3 marks)



16.

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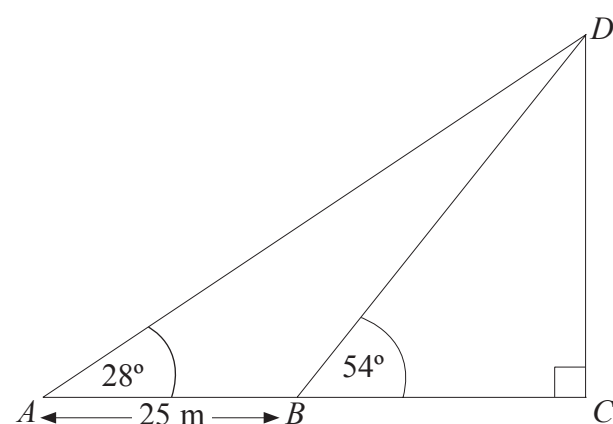


Diagram **NOT**
accurately drawn

The diagram shows a vertical tower DC on horizontal ground ABC .
 ABC is a straight line.

The angle of elevation of D from A is 28° .
The angle of elevation of D from B is 54° .

$AB = 25$ m.

Calculate the height of the tower.
Give your answer correct to 3 significant figures.

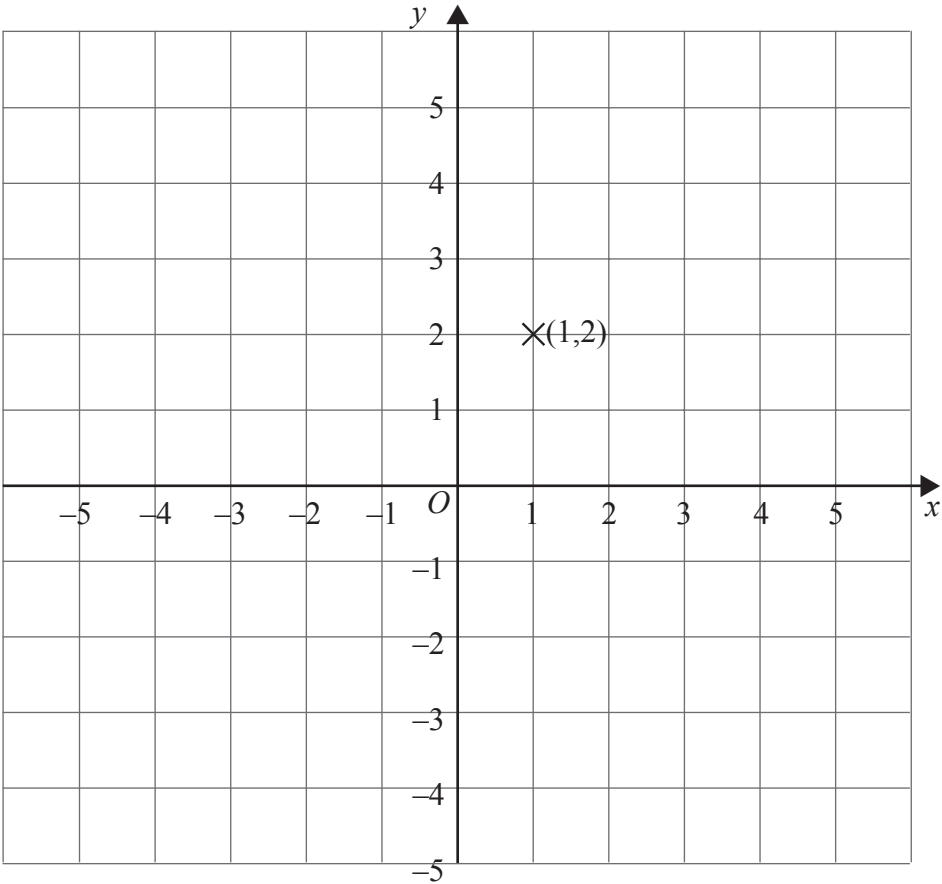
..... m

Q16

(Total 5 marks)



17. Show that any straight line that passes through the point (1, 2) must intersect the curve with equation $x^2 + y^2 = 16$ at two points.



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Q17

(Total 3 marks)

TOTAL FOR PAPER: 62 MARKS

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