

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 11 June 2007 – 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. Write your answers 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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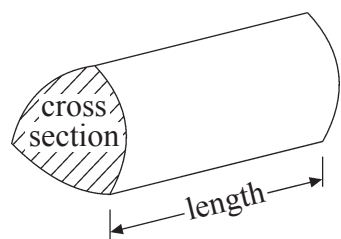
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GCSE Mathematics 1387/8

Formulae: Higher Tier

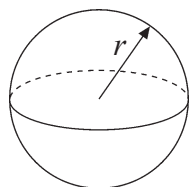
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



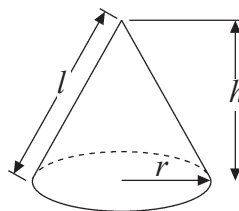
Volume of sphere = $\frac{4}{3}\pi r^3$

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

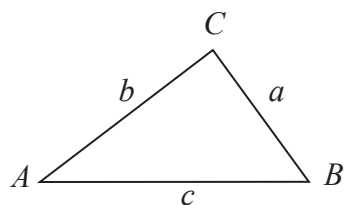


Volume of cone = $\frac{1}{3}\pi r^2 h$

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



In any triangle ABC



The Quadratic Equation

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

where $a \neq 0$, are given by

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

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 = $\frac{1}{2} ab \sin C$



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Answer ALL SEVENTEEN questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. A shop sells CDs and DVDs.
In one week the number of CDs sold and the number of DVDs sold were in the ratio 3:5
The total number of CDs and DVDs sold in the week was 728

Work out the number of CDs sold.

.....
Q1

(Total 2 marks)

2. Here are the first 4 terms of an arithmetic sequence.

2 5 8 11

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

.....
Q2

(Total 2 marks)

3

Turn over



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3. The equation

$$x^3 - x = 30$$

has a solution between 3 and 4
Use a trial and improvement method to find this solution.
Give your answer correct to 1 decimal place.
You must show **all** your working.

$x = \dots\dots\dots$

Q3

(Total 4 marks)

4. Seejal says

“If a and b are prime numbers greater than 2, then $a \times b$ is always an odd number.”

Is Seejal correct?

Give reasons for your answer.

.....
.....
.....

Q4

(Total 2 marks)





<p>5. James invested £2000 for three years in an Internet Savings Account. He is paid 5.5% per annum compound interest.</p> <p>Work out the total interest earned after three years.</p> <p style="text-align: right;">£</p> <p style="text-align: right;">(Total 3 marks)</p>	<p>Leave blank</p> <p style="text-align: center;">Q5</p> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto;"></div>
<p>6. Use your calculator to work out the value of $\sqrt{\frac{5}{9.86 + 3.24^2}}$</p> <p>Write down all the figures on your calculator display.</p> <p style="text-align: right;">.....</p> <p style="text-align: right;">(Total 3 marks)</p>	<p style="text-align: center;">Q6</p> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto;"></div>



M 2 5 7 7 6 A 0 5 1 6



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7. The table gives some information about the time taken by a group of 100 students to complete an IQ test.

Time (t seconds)	Frequency	
$60 < t \leq 70$	12	
$70 < t \leq 80$	22	
$80 < t \leq 90$	23	
$90 < t \leq 100$	24	
$100 < t \leq 110$	19	

Calculate an estimate for the mean time taken by the students.

..... seconds

(Total 4 marks)

Q7

8. Solve $\frac{2x+5}{3} = 6$

$x =$

(Total 2 marks)

Q8



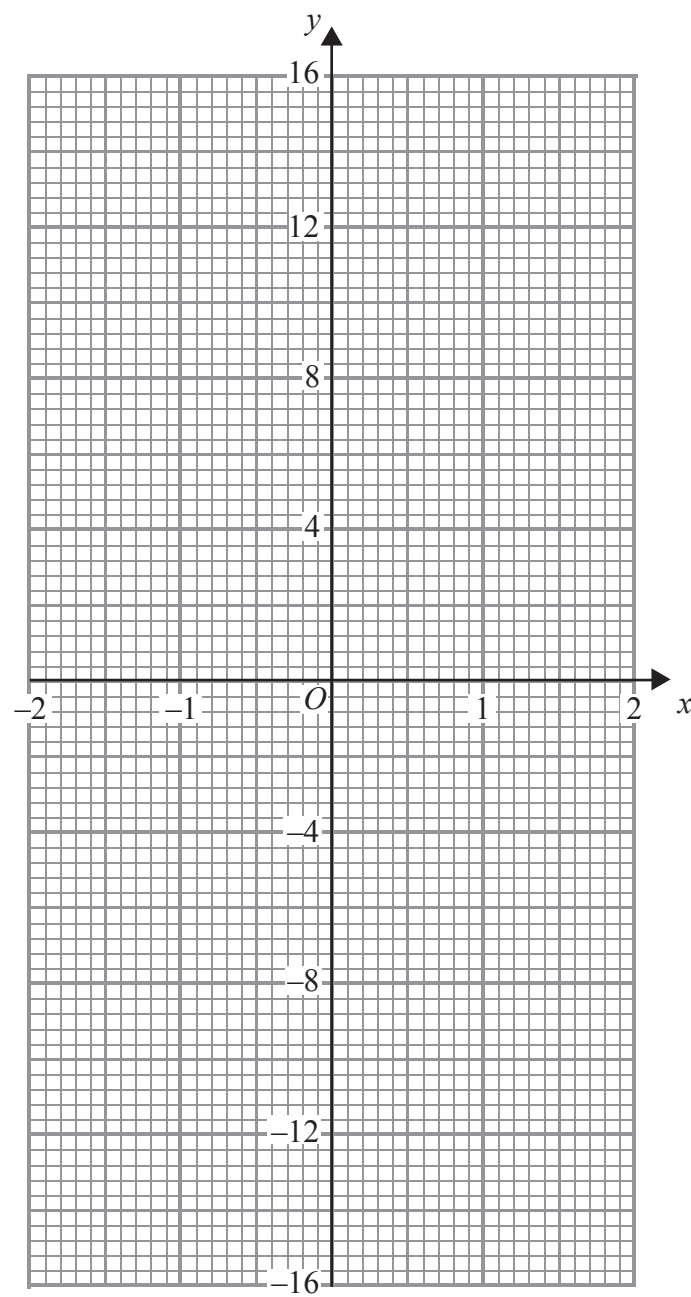
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9. (a) Complete the table of values for $y = x^3 + 3x$

x	-2	-1	0	1	2
y	-14		0		

(2)

(b) On the grid, draw the graph of $y = x^3 + 3x$



(2)

(Total 4 marks)

Q9



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10. The diagram shows two quadrilaterals that are mathematically **similar**.

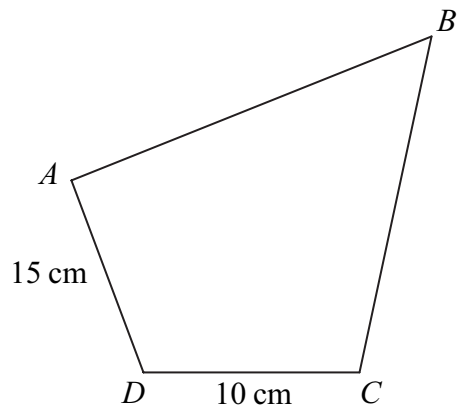
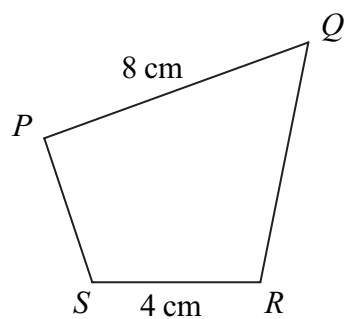


Diagram **NOT** accurately drawn

In quadrilateral $PQRS$, $PQ = 8$ cm, $SR = 4$ cm.
In quadrilateral $ABCD$, $AD = 15$ cm, $DC = 10$ cm.
Angle $PSR =$ angle ADC .
Angle $SPQ =$ angle DAB .

(a) Calculate the length of AB .

..... cm
(2)

(b) Calculate the length of PS .

..... cm
(2)

(Total 4 marks)

Q10



Leave
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11. (a) Expand and simplify $(x + 3)(x - 4)$

.....
(2)

(b) Simplify fully $3p^5q \times 4p^3q^2$

.....
(2)

(c) $p = 3t + 4(q - t)$

Find the value of q when $p = 6$ and $t = 5$

$q =$
(3)

Q11

(Total 7 marks)



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12. In a spring, the tension (T newtons) is directly proportional to its extension (x cm).

When the tension is 150 newtons, the extension is 6 cm.

(a) Find a formula for T in terms of x .

$$T = \dots\dots\dots$$

(3)

(b) Calculate the tension, in newtons, when the extension is 15 cm.

\dots\dots\dots newtons
(1)

(c) Calculate the extension, in cm, when the tension is 600 newtons.

\dots\dots\dots cm
(1)

(Total 5 marks)

Q12



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- 13.** There are three age groups in a competition.
The table shows the number of competitors in each age group.

16-18 years	19-24 years	25+ years
120	250	200

John wants to do a survey of the competitors.
He uses a stratified sample of exactly 50 competitors according to each age group.

Work out the number of competitors in each age group that should be in his stratified sample of 50.

16-18 years:

19-24 years:

25+ years:

(Total 3 marks)

Q13



14.

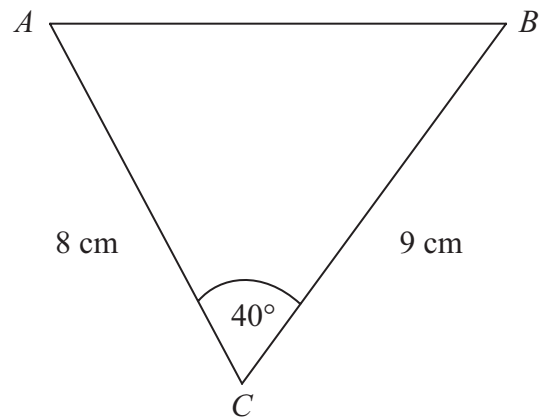


Diagram **NOT** accurately drawn

ABC is a triangle.
 $AC = 8$ cm.
 $BC = 9$ cm.
Angle $ACB = 40^\circ$.

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

Leave blank

..... cm

Q14

(Total 3 marks)



Leave
blank

15. Martin has a pencil case which contains 4 blue pens and 3 green pens.

Martin picks a pen at random from the pencil case. He notes its colour, and then replaces it. He does this two more times.

Work out the probability that when Martin takes three pens, exactly two are the same colour.

.....
Q15

(Total 3 marks)

13

Turn over



16.

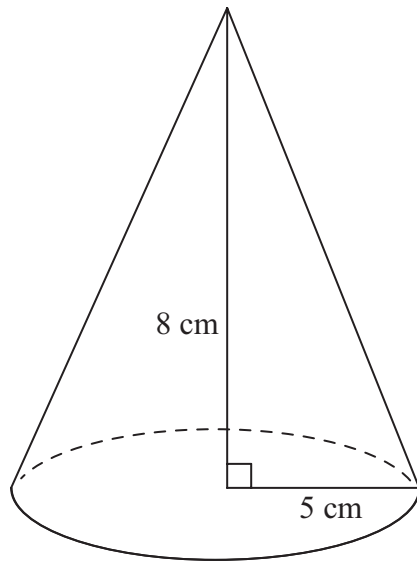


Diagram **NOT** accurately drawn

A cone has a base radius of 5 cm and a vertical height of 8 cm.

- (a) Calculate the volume of the cone.
Give your answer correct to 3 significant figures.

..... cm³
(2)



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blank

Here is the net of a different cone.

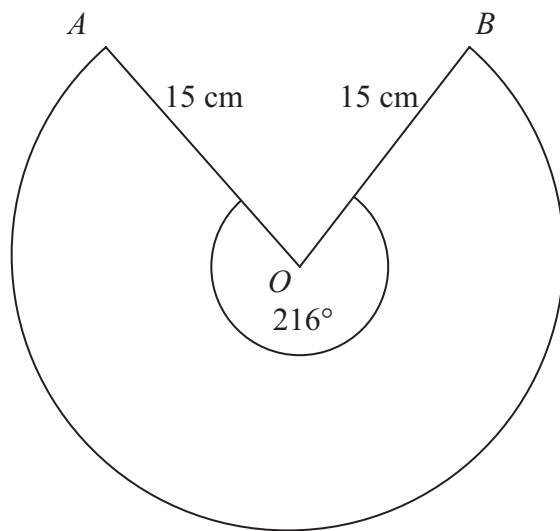


Diagram **NOT**
accurately drawn

The net is a sector of a circle, centre O , and radius 15 cm.
Reflex angle $AOB = 216^\circ$
The net makes a cone of slant height 15 cm.

(b) Work out the vertical height of the cone.

..... cm
(4)

(Total 6 marks)

Q16

15

Turn over



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17. The diagram shows a cuboid.

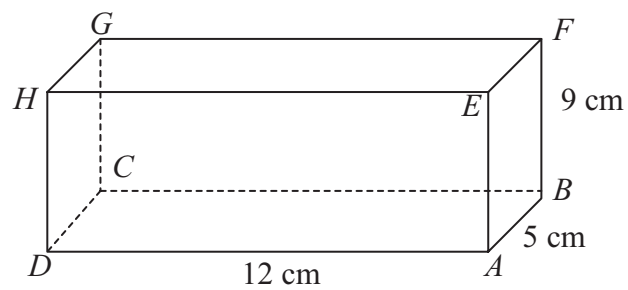


Diagram **NOT** accurately drawn

The cuboid has length 12 cm, width 5 cm and height 9 cm.

- (a) Calculate the length of the diagonal DF of the cuboid.
Give your answer correct to 3 significant figures.

..... cm
(2)

- (b) Calculate the size of the angle that the line DF makes with the plane $ABCD$.
Give your answer correct to 1 decimal place.

..... °
(3)

Q17

(Total 5 marks)

TOTAL FOR PAPER: 62 MARKS

END

