

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



Examiner's use only

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Team Leader's use only

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Friday 9 November 2007 – Morning

Time: 1 hour 15 minutes

**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  $\pi$  button, take the value of  $\pi$  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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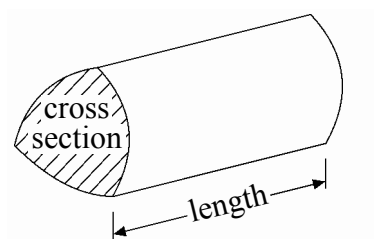
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GCSE Mathematics 1387/8

Formulae: Higher Tier

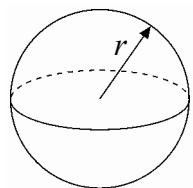
**You must not write on this formulae page.**  
**Anything you write on this formulae page will gain NO credit.**

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



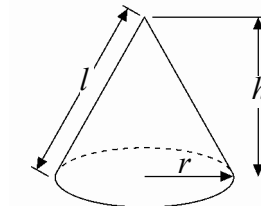
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

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

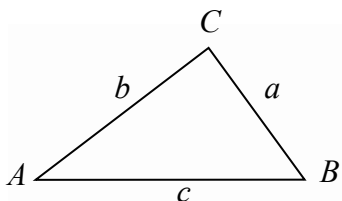


**Volume of cone** =  $\frac{1}{3}\pi r^2 h$

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

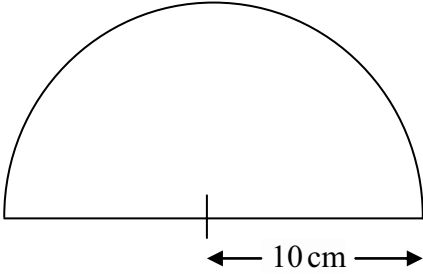


<p><b>Answer ALL SEVENTEEN questions.</b></p> <p><b>Write your answers in the spaces provided.</b></p> <p><b>You must write down all stages in your working.</b></p> <p><b>1.</b> In April 2004, the population of the European Community was 376 million.</p> <p>In April 2005, the population of the European Community was 451 million.</p> <p>Work out the percentage increase in population.</p> <p>Give your answer correct to 1 decimal place.</p> <p>.....%</p> <p><b>(Total 3 marks)</b></p>	<p>Leave blank</p> <p><b>Q1</b></p> <input type="text"/>
<p><b>2.</b> The equation</p> $x^3 - 5x = 60$ <p>has a solution between 4 and 5.</p> <p>Use a trial and improvement method to find this solution.</p> <p>Give your answer correct to 1 decimal place.</p> <p>You must show <b>all</b> your working.</p> <p>.....</p> <p><b>(Total 4 marks)</b></p>	<p><b>Q2</b></p> <input type="text"/>



3.

Diagram **NOT**  
accurately drawn



The diagram shows a semicircle.  
The radius of the semicircle is 10 cm.

Calculate the area of the semicircle.  
Give your answer correct to 3 significant figures.  
State the units of your answer.

.....

(Total 3 marks)

Q3

4.

Ali found out the number of rooms in each of 40 houses in a town.  
He used the information to complete the frequency table.

Number of Rooms	Frequency	
4	4	
5	7	
6	10	
7	12	
8	5	
9	2	

Ali said that the mode is 9  
Ali is wrong.

(a) Explain why.

.....

.....

(1)



Leave  
blank

(b) Beccy found out the number of rooms in each of 80 houses in the same town. She used the information to complete the frequency table below.

Number of Rooms	Frequency
4	10
5	12
6	15
7	18
8	17
9	8

Find the median number of rooms.

.....  
(1)

(c) The median number of rooms in Ali’s table is 6

Which of the two medians, Ali’s or Beccy’s, is more likely to give the more reliable estimate for the median number of rooms for a house in this town?

.....

Give a reason for your answer.

.....  
.....

(1)

Q4

(Total 3 marks)

5. In a sale, normal prices are reduced by 25%.  
The sale price of a saw is £12.75

Calculate the normal price of the saw.

£ .....

Q5

(Total 3 marks)



6. Write 720 as a product of its prime factors.

Leave  
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Q6

**(Total 2 marks)**

7.

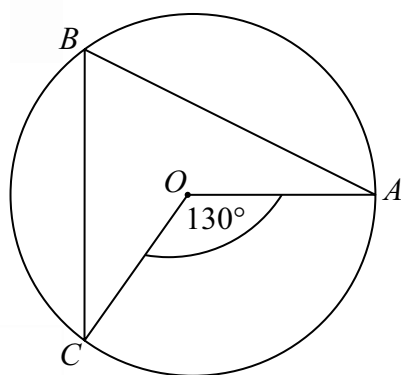


Diagram **NOT**  
accurately drawn

- (a) In the diagram,  $O$  is the centre of the circle.  
 $A$ ,  $B$  and  $C$  are points on the circle.

Angle  $COA = 130^\circ$ .

- (i) Find the size of angle  $CBA$ .

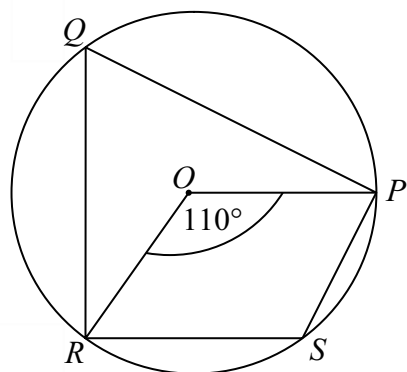
(ii) Give a reason for your answer.

(2)



Leave  
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Diagram **NOT**  
accurately drawn



- (b) In the diagram,  $O$  is the centre of the circle.  
 $P$ ,  $Q$ ,  $R$  and  $S$  are points on the circle.

Angle  $ROP = 110^\circ$

Calculate the size of angle  $RSP$ .

o

.....

(2)

Q7

(Total 4 marks)



<p>8. Use your calculator to work out the value of <math>\frac{1 - \tan 25^\circ}{1 + \tan 25^\circ}</math></p> <p>Write down all the figures on your calculator display.</p> <p>.....</p> <p>(Total 2 marks)</p>	<p>Leave blank</p> <p><b>Q8</b></p> <div></div>
<p>9. <math>f</math> is inversely proportional to <math>d</math>.</p> <p>When <math>d = 50, f = 256</math></p> <p>(a) Find the value of <math>f</math> when <math>d = 80</math></p> <p><math>f = \dots\dots\dots</math></p> <p>(3)</p> <p>(b) Find the value of <math>d</math> when <math>f = 125</math></p> <p><math>d = \dots\dots\dots</math></p> <p>(2)</p> <p>(Total 5 marks)</p>	<p><b>Q9</b></p> <div></div>





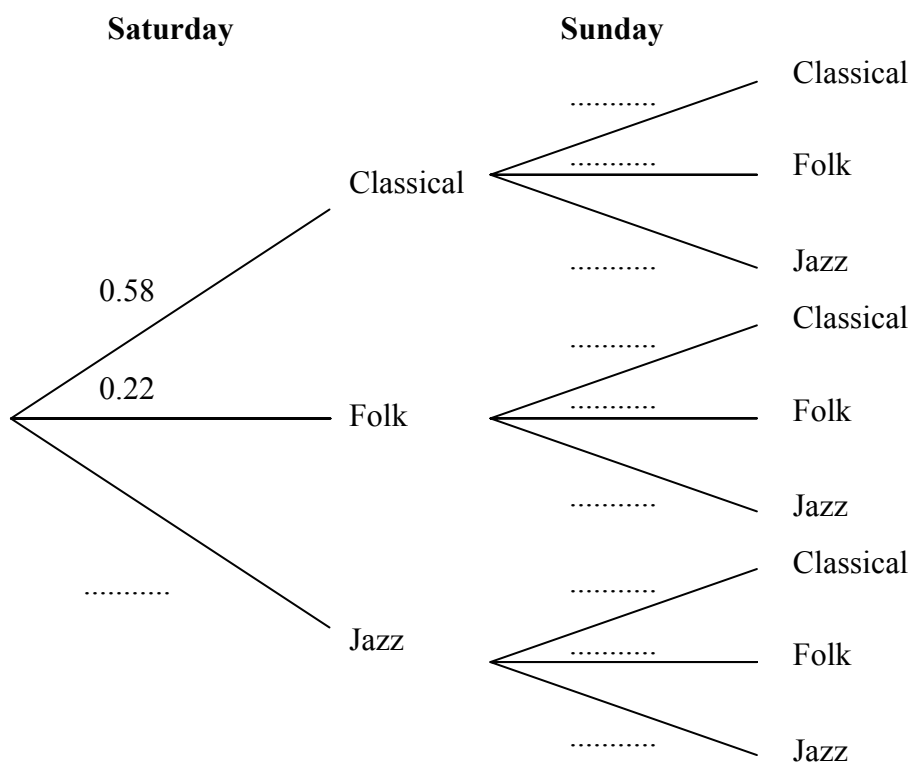
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10. Julie has 100 music CDs.  
58 of the CDs are classical.  
22 of the CDs are folk.  
The rest of the CDs are jazz.

On Saturday, Julie chooses one CD at random from the 100 CDs.  
On Sunday, Julie chooses one CD at random from the 100 CDs.

- (a) Complete the probability tree diagram.

(2)



- (b) Calculate the probability that Julie will choose at least one jazz CD on Saturday **and** Sunday.

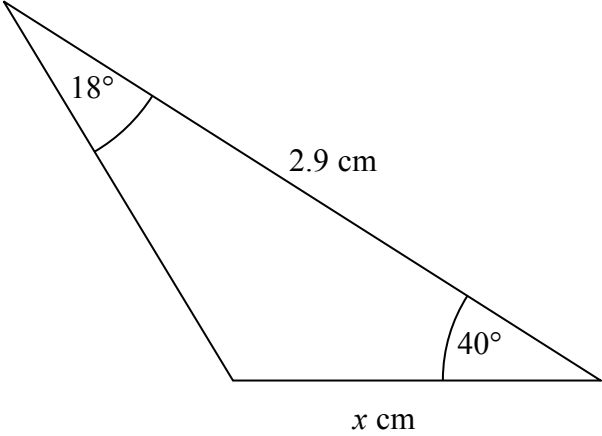
(3)

Q10

(Total 5 marks)



H 3 1 1 2 2 A 0 9 1 6

<p>11. Change <math>3.5 \text{ m}^3</math> to <math>\text{cm}^3</math>.</p> <p>..... <math>\text{cm}^3</math></p> <p>(Total 2 marks)</p>	<p>Leave blank</p> <p><b>Q11</b></p> <div></div>
<p>12.</p>  <p>Diagram <b>NOT</b> accurately drawn</p> <p>Work out the value of <math>x</math>. Give your answer correct to 3 significant figures.</p> <p><math>x =</math> .....</p> <p>(Total 3 marks)</p>	<p><b>Q12</b></p> <div></div>



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- 13.** The diagram shows a 6-sided shape.  
All the corners are right angles.  
All the measurements are given in centimetres.

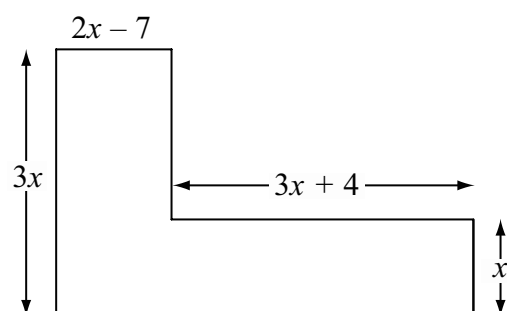


Diagram **NOT**  
accurately drawn

The area of the shape is  $85 \text{ cm}^2$ .

- (a) Show that  $9x^2 - 17x - 85 = 0$

(3)

- (b) Solve  $9x^2 - 17x - 85 = 0$

Give your solutions correct to 3 significant figures.

$x = \dots\dots\dots$  or  $x = \dots\dots\dots$

(3)

Q13

(Total 6 marks)

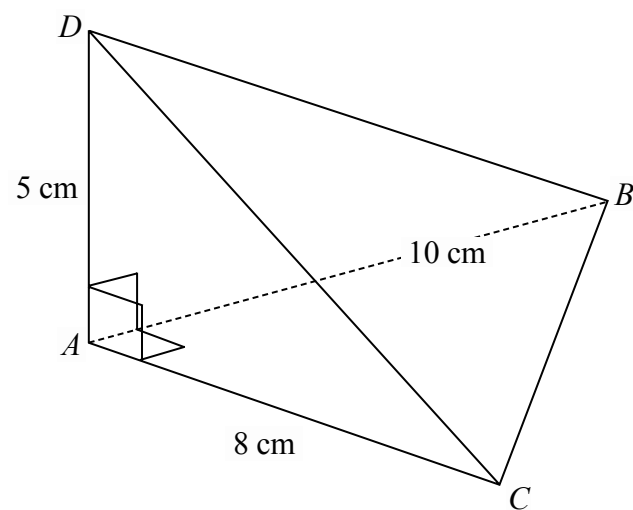


<div>14. Rationalise the denominator of <math>\frac{2}{\sqrt{5}}</math></div> <div>.....</div> <div>(Total 2 marks)</div>	<div>Leave blank</div> <div>Q14</div> <div></div>
<div>15. <math>y = \frac{2pt}{p-t}</math></div> <div>Rearrange the formula to make <math>t</math> the subject.</div> <div><math>t =</math> .....</div> <div>(Total 4 marks)</div>	<div>Q15</div> <div></div>



16.

Diagram **NOT**  
accurately drawn



The diagram shows a tetrahedron.  
 $AD$  is perpendicular to both  $AB$  and  $AC$ .  
 $AB = 10$  cm.  
 $AC = 8$  cm.  
 $AD = 5$  cm.  
Angle  $BAC = 90^\circ$ .

Calculate the size of angle  $BDC$ .  
Give your answer correct to 1 decimal place.

Leave  
blank

Q16

(Total 6 marks)



H 3 1 1 2 2 A 0 1 3 1 6

17.  $x^2 - 8x + 23 = (x - p)^2 + q$  for all values of  $x$ .

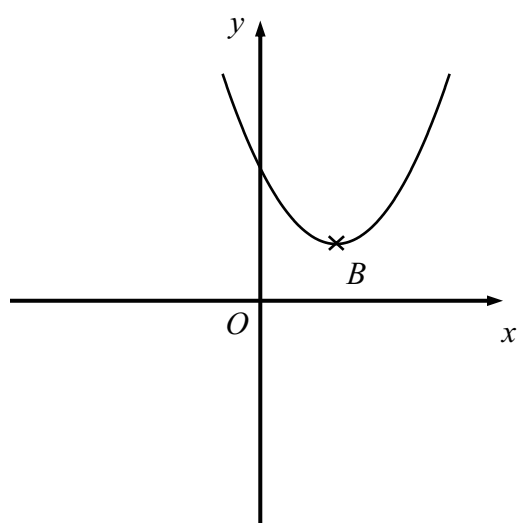
(a) Find the value of  $p$  and the value of  $q$ .

$p = \dots\dots\dots$

$q = \dots\dots\dots$

**(3)**

Here is a sketch of the curve with equation  $y = x^2 - 8x + 23$



$B$  is the minimum point on the curve.

(b) Find the coordinates of  $B$ .

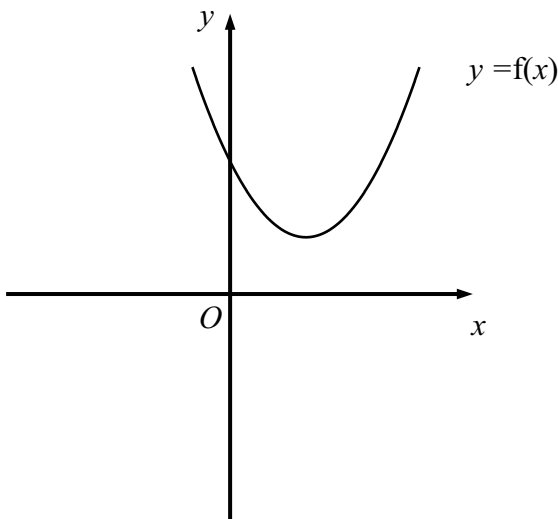
(..... , .....)

**(1)**



The equation of the curve can be written in the form  $y = f(x)$ , where  $f(x) = x^2 - 8x + 23$

(c) On the diagram below, draw a sketch of the curve  $y = f(-x)$ .



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(1)

Q17

(Total 5 marks)

TOTAL FOR PAPER: 62 MARKS

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