Centre No.						Paper Reference								Surname	Initial(s)
Candidate No.						5	3	8	4	H	/	1	3	H	Signature

Paper Reference(s)

5384H/13H

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics (Modular) – 2381

Paper 13 (Non-Calculator)

Higher Tier

Unit 3

Monday 18 May 2009 – Afternoon

Time: 1 hour 10 minutes

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
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 19 questions in this question paper. The total mark for this paper is 60.
There are 16 pages in this question paper. Any blank pages are indicated.
Calculators must not be used.

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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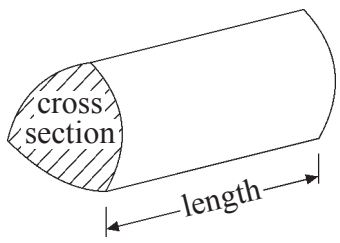
GCSE Mathematics

Formulae: Higher Tier

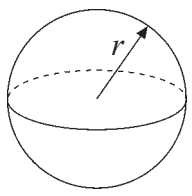
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length



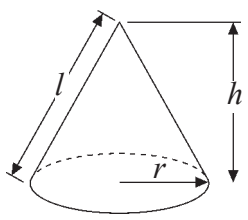
Volume of sphere $= \frac{4}{3}\pi r^3$

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

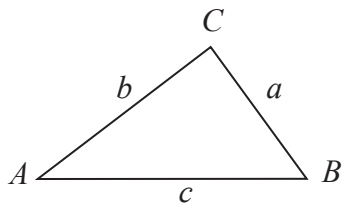


Volume of cone $= \frac{1}{3}\pi r^2 h$

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

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

Leave blank

Answer ALL NINETEEN questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1. Here is a list of ingredients for making **8** cheese scones.

Ingredients for 8 cheese scones
200 g self-raising flour
60 g butter
30 g cheese
150 m*l* milk

Work out the amount of each ingredient needed to make **12** cheese scones.

..... g self-raising flour

..... g butter

..... g cheese

..... m*l* milk

(Total 3 marks)

Q1

2. Work out $\frac{3}{5} \times \frac{1}{4}$

.....

(Total 2 marks)

Q2

Leave blank

3.

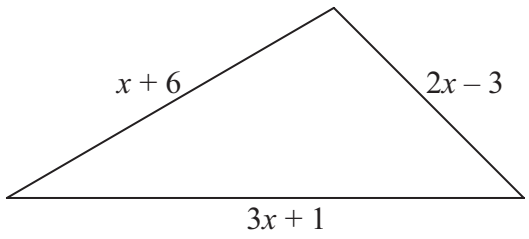


Diagram **NOT** accurately drawn

In the diagram, all measurements are in centimetres.

The lengths of the sides of the triangle are

$x + 6$
$2x - 3$
$3x + 1$

(a) Find an expression, in terms of x, for the perimeter of the triangle.

Give your expression in its simplest form.

.....

(2)

The perimeter of the triangle is 37 cm.

(b) Find the value of x.

$x =$ .....

(2)

Q3

(Total 4 marks)

Leave blank

4. Alan bought 20 melons for £15

$\frac{1}{5}$ of the melons were bad so he threw them away.

He sold the remaining melons for £1.50 each.

Work out Alan's profit.

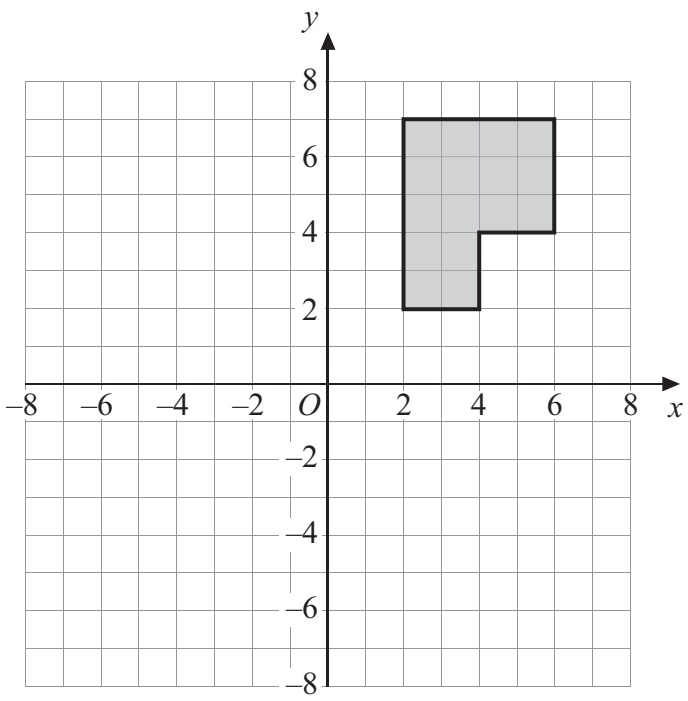
£ .....

Q4

(Total 4 marks)

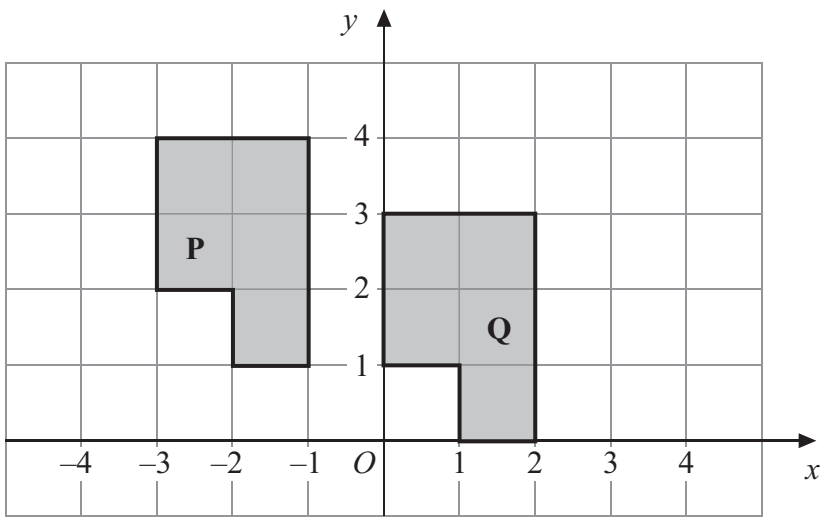
Leave blank

5.



(a) Rotate the shaded shape 90° clockwise about the point O.

(2)



(b) Describe fully the single transformation that will map shape **P** onto shape **Q**.

.....

(2)

(Total 4 marks)

Q5

Leave blank

6. (a) Solve $2(y - 3) = 8$

$y =$ .....

(2)

(b) Solve $4x + 1 = 2x + 12$

$x =$ .....

(2)

Q6

(Total 4 marks)

7. $2x^2 = 72$

Find a value of x.

.....

Q7

(Total 2 marks)

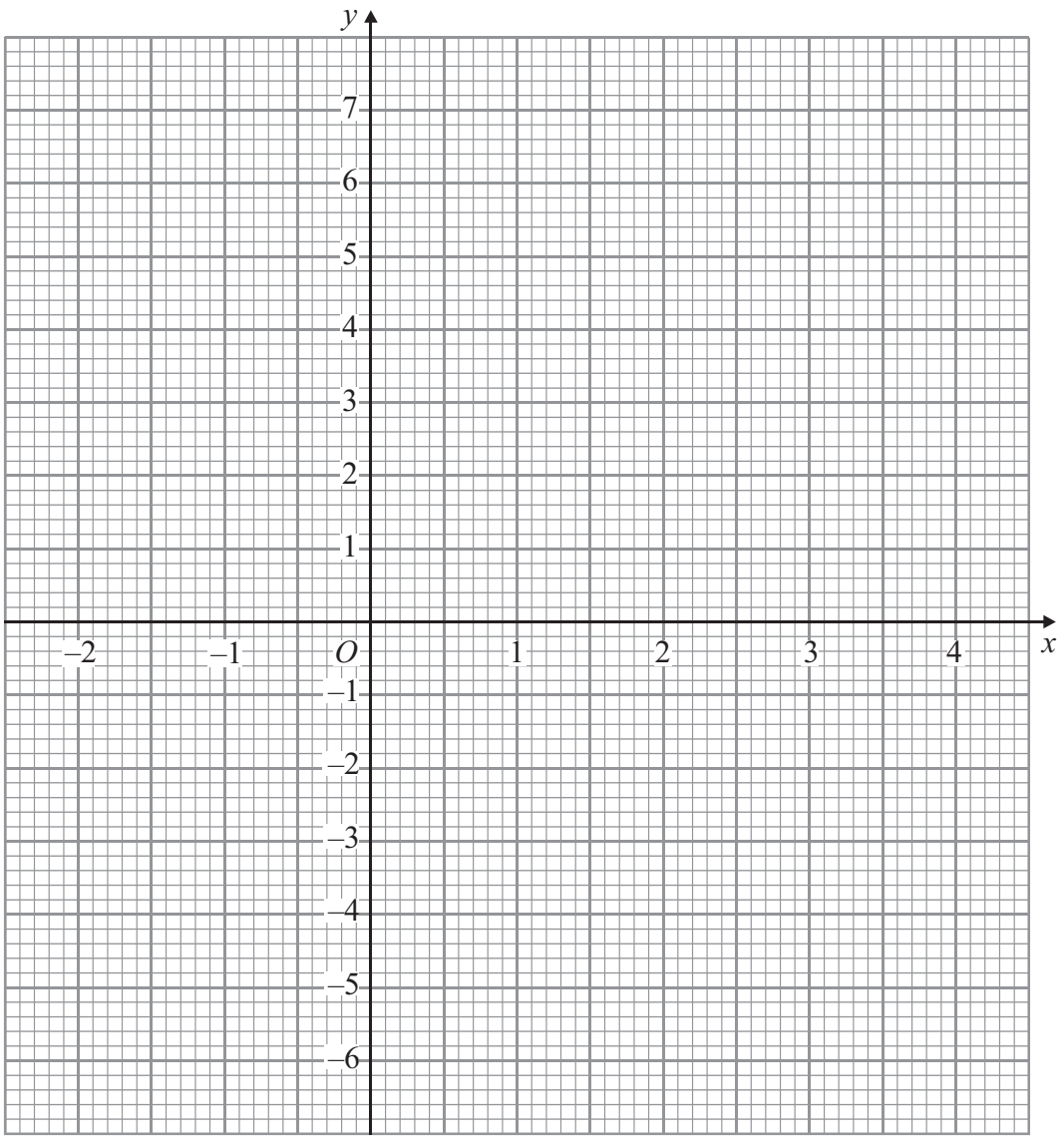
Leave blank

8. (a) Complete the table for $y = x^2 - 2x - 4$

x	–2	–1	0	1	2	3	4
y	4		–4	–5		–1	

(2)

(b) On the grid, draw the graph of $y = x^2 - 2x - 4$

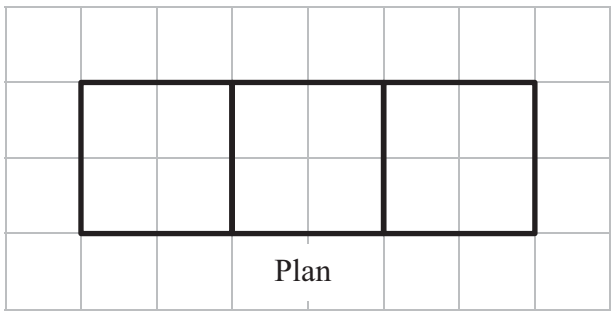


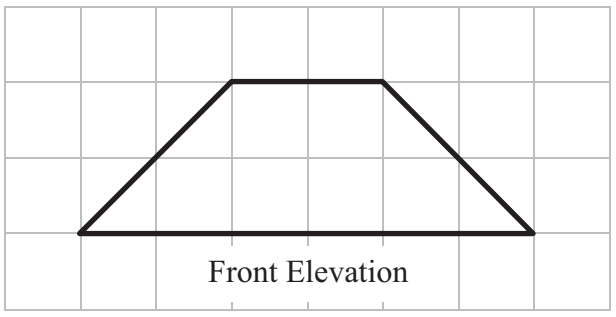
(2) **Q8**

(Total 4 marks)

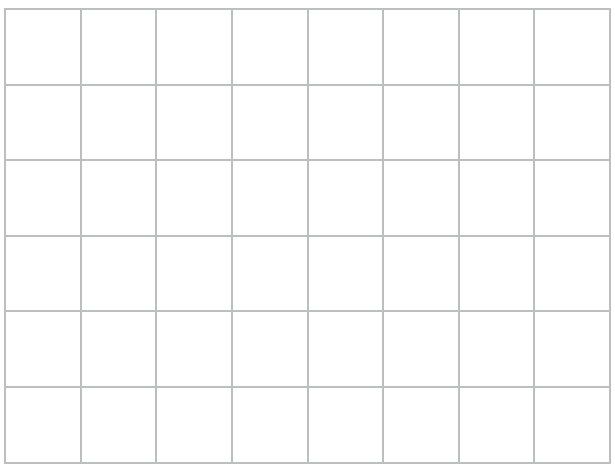
Leave blank

9. Here are the plan and front elevation of a solid shape.





(a) On the grid below, draw the side elevation of the solid shape.



(2)

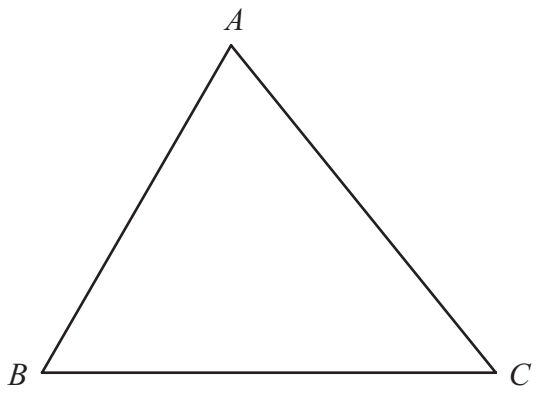
(b) In the space below, draw a sketch of the solid shape.

(2) **Q9**

(Total 4 marks)

Leave blank

10.



ABC is a triangle.

Shade the region inside the triangle which is **both**

less than 4 centimetres from the point *B*
and closer to the line *AC* than the line *AB*.

Q10

(Total 4 marks)

Leave blank

11. Solve the simultaneous equations

$$3x + 4y = 7$$
$$5x - 2y = 16$$

$x =$ .....

$y =$ .....

(Total 3 marks)

Q11

12. (a) Solve the inequality

$$3t + 1 < t + 12$$

.....

(2)

(b) t is a whole number.
Write down the largest value of t that satisfies

$$3t + 1 < t + 12$$

.....

(1)

Q12

(Total 3 marks)

Leave blank

13.

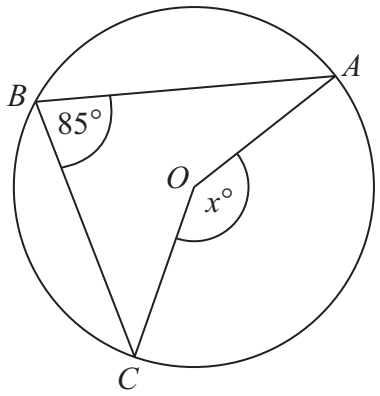


Diagram **NOT** accurately drawn

In the diagram, A, B and C are points on the circumference of a circle, centre O.

Angle $ABC = 85^\circ$.

(i) Work out the size of the angle marked x°.

..... °

(ii) Give a reason for your answer.

.....

.....

Q13

(Total 2 marks)

14. Solve $x^2 - 4x - 45 = 0$

.....

Q14

(Total 3 marks)

Leave blank

15. (a) Find the value of $36^{\frac{1}{2}}$

.....

(1)

(b) Find the value of $8^{-\frac{2}{3}}$

.....

(2) **Q15**

(Total 3 marks)

Leave blank

16.

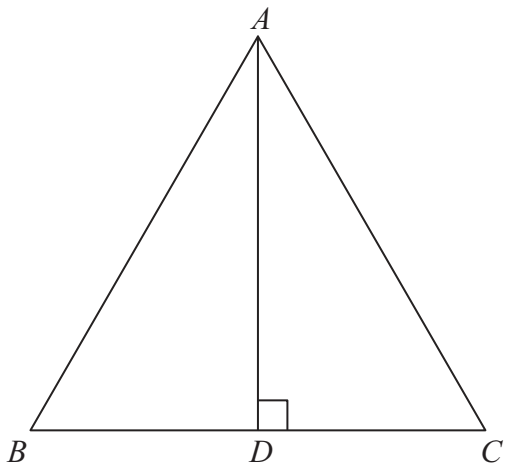


Diagram **NOT** accurately drawn

ABC is an equilateral triangle.
D lies on *BC*.
AD is perpendicular to *BC*.

Prove that triangle *ADC* is congruent to triangle *ADB*.

Q16

(Total 3 marks)

Leave blank

17. Rearrange $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$

to make u the subject of the formula.

Give your answer in its simplest form.

.....

Q17

(Total 2 marks)

18. Expand and simplify

$$(2+\sqrt{3})(7-\sqrt{3})$$

Give your answer in the form $a + b\sqrt{3}$, where a and b are integers.

.....

Q18

(Total 3 marks)

Leave blank

19.

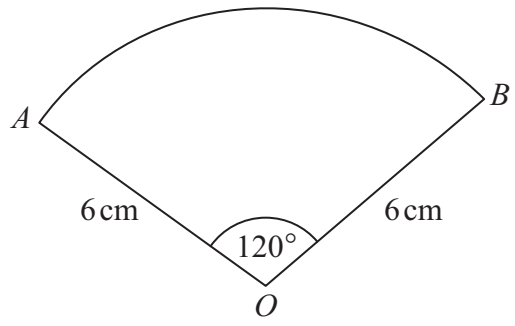


Diagram **NOT** accurately drawn

The diagram shows a sector of a circle, centre O.
The radius of the circle is 6 cm.
Angle $AOB = 120^\circ$.

Work out the **perimeter** of the sector.
Give your answer in terms of π in its simplest form.

..... cm

Q19

(Total 3 marks)

TOTAL FOR PAPER: 60 MARKS

END