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

Wednesday 9 November 2011 – 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 14 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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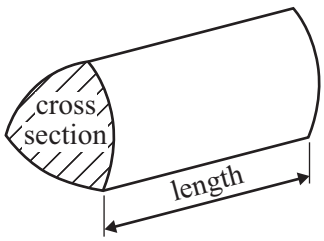
GCSE Mathematics 2381

Formulae: Higher Tier

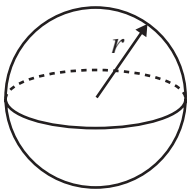
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length



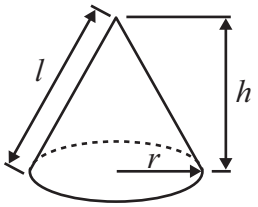
Volume of sphere $= \frac{4}{3}\pi r^3$

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

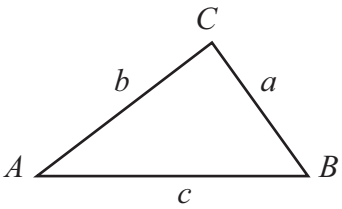


Volume of cone $= \frac{1}{3}\pi r^2 h$

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 FOURTEEN questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1. Theo earns £20 one weekend.
He gives £4 to his brother.

(a) Express £4 as a fraction of £20
Give your answer in its simplest form.

.....
(2)

Theo gives £6 to his mother.

(b) Express £6 as a percentage of £20

..... %
(2)

Theo spent the remaining £10 on bus fares and food.
He spent £1.50 more on bus fares than on food.

(c) How much did he spend on bus fares?

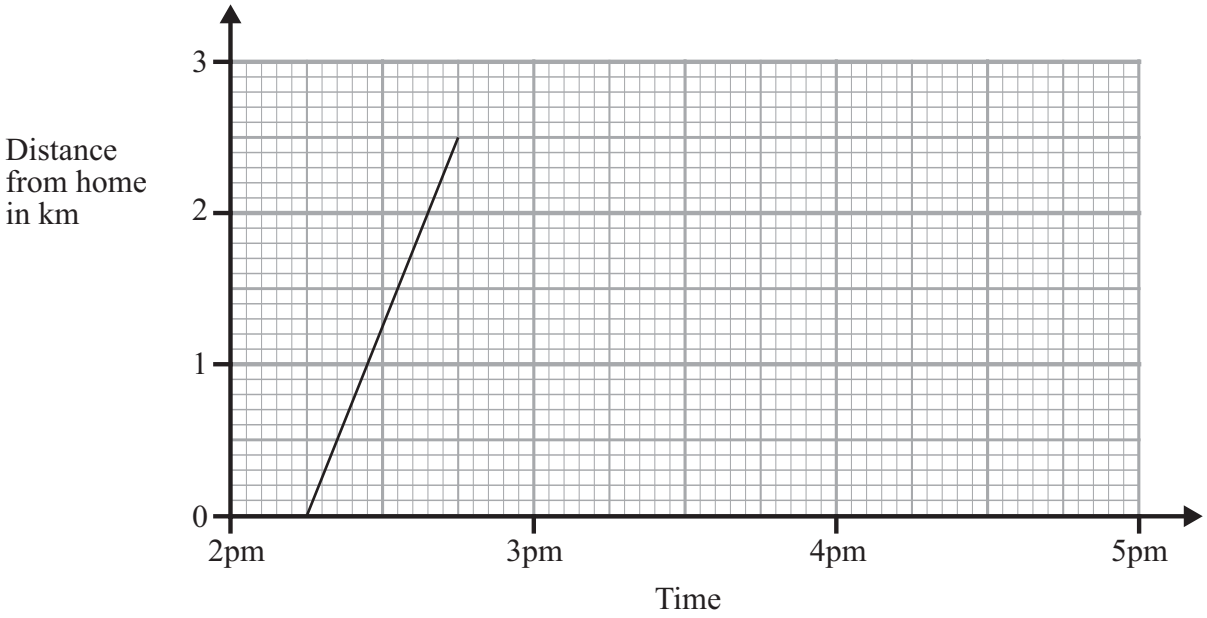
£ .....
(2)

Q1

(Total 6 marks)

Leave blank

2. Janet walked from her home to the library.
The distance-time graph shows Janet's journey to the library.



(a) Work out Janet's average speed for her journey from home to the library.
Give your answer in kilometres per hour.

..... kilometres per hour
(2)

Janet spent 60 minutes in the library.
She then walked home at a steady speed.
It took her 45 minutes to walk home.

(b) Complete the distance-time graph.

(2) **Q2**

(Total 4 marks)

Leave blank

3.

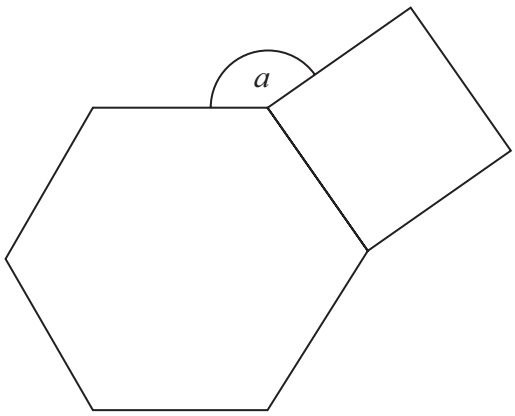


Diagram **NOT** accurately drawn

The diagram shows a regular hexagon and a square.

Calculate the size of the angle *a*.

..... °

Q3

(Total 4 marks)

4. Work out $\frac{2}{3} + \frac{1}{7}$

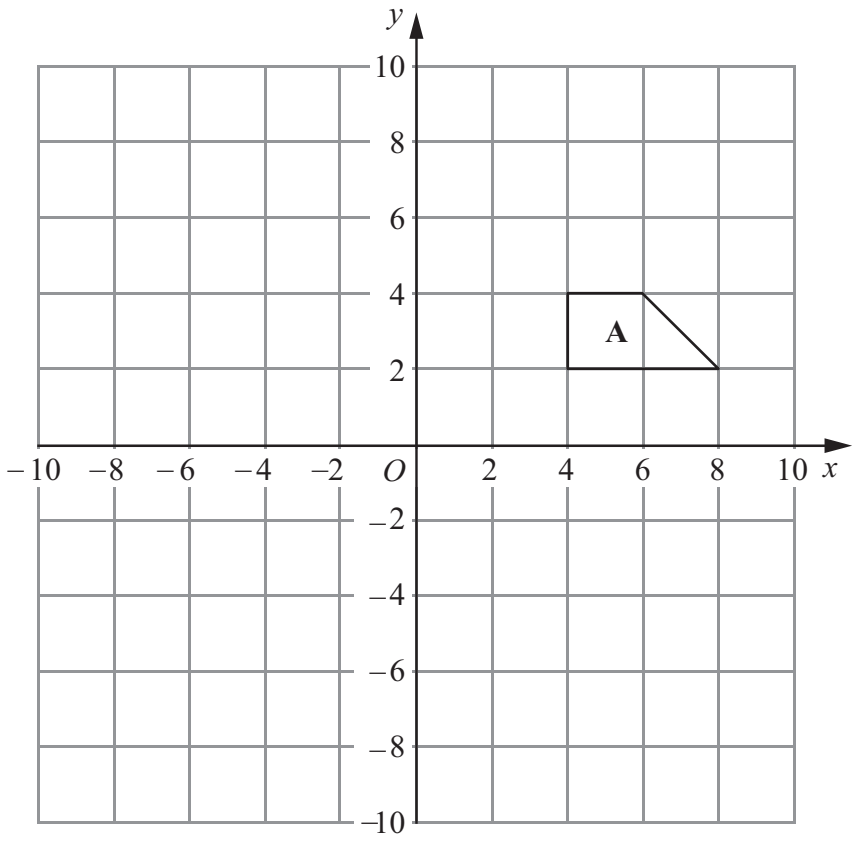
.....

Q4

(Total 2 marks)

Leave blank

5.

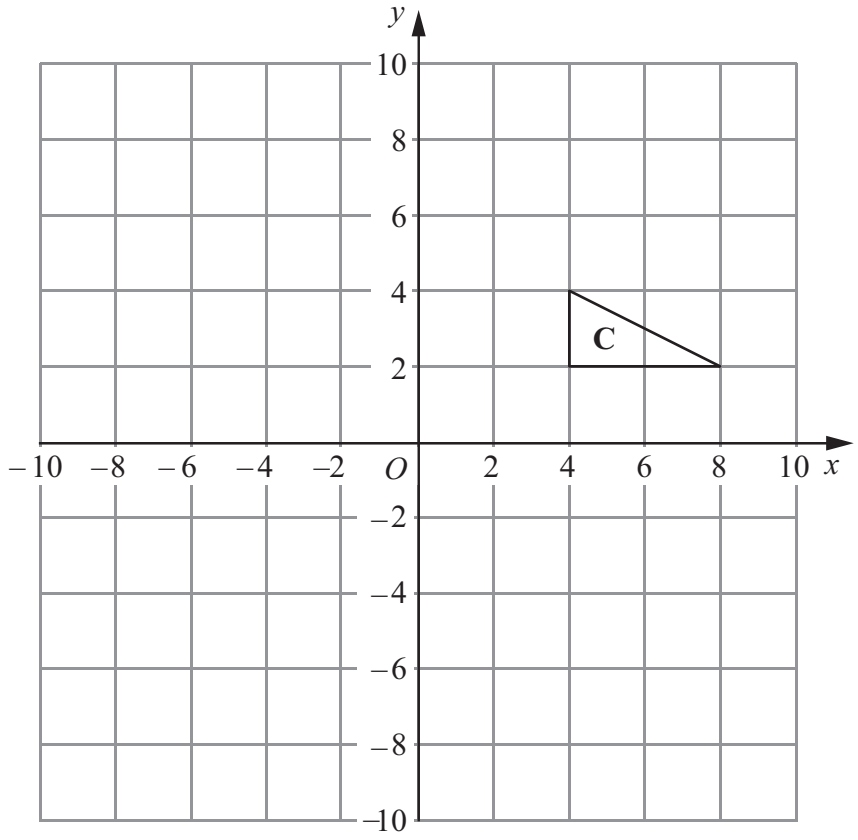


(a) Translate shape **A** by $\begin{pmatrix} -8 \\ -2 \end{pmatrix}$

Label the new shape **B**.

(2)

Leave blank



(b) Reflect shape **C** in the line $y = x$.
Label the new shape **D**.

(2) **Q5**

(Total 4 marks)

Leave blank

6. Two shops both sell the same type of suit.
In both shops the price of the suit was £180

One shop increases the price of the suit by $17\frac{1}{2}\%$.

The other shop increases the price of the suit by $22\frac{1}{2}\%$.

Calculate the difference between the new prices of the suits in the two shops.

£ .....

(Total 3 marks)

Q6

Leave blank

7. (a) Solve $3(2t - 4) = 2t + 12$

$t =$ .....

(3)

(b) Solve $x^2 + 2x - 15 = 0$

.....

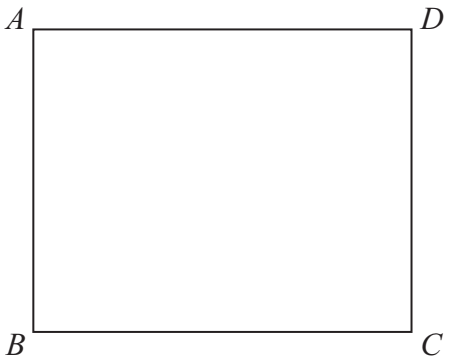
(3) **Q7**

(Total 6 marks)

Leave blank

8. The diagram represents a rectangular garden *ABCD*.

The scale of the diagram is 1 cm represents 2 m.



Scale: 1 cm represents 2 m

Richard is going to plant a tree in the garden.
The tree must be **both**

closer to the point *B* than to the point *D*
and less than 6 metres from the point *C*.

On the diagram, shade the region in which Richard can plant the tree. **Q8**

(Total 3 marks)

Leave blank

9. Solve the simultaneous equations

$$3x + 4y = 200$$
$$2x + 3y = 144$$

$x =$ .....

$y =$ .....

Q9

(Total 4 marks)

Leave blank

10. (a) Work out the value of $(6 \times 10^8) \times (4 \times 10^7)$

Give your answer in standard form.

.....

(2)

(b) Work out the value of $(6 \times 10^8) + (4 \times 10^7)$

Give your answer in standard form.

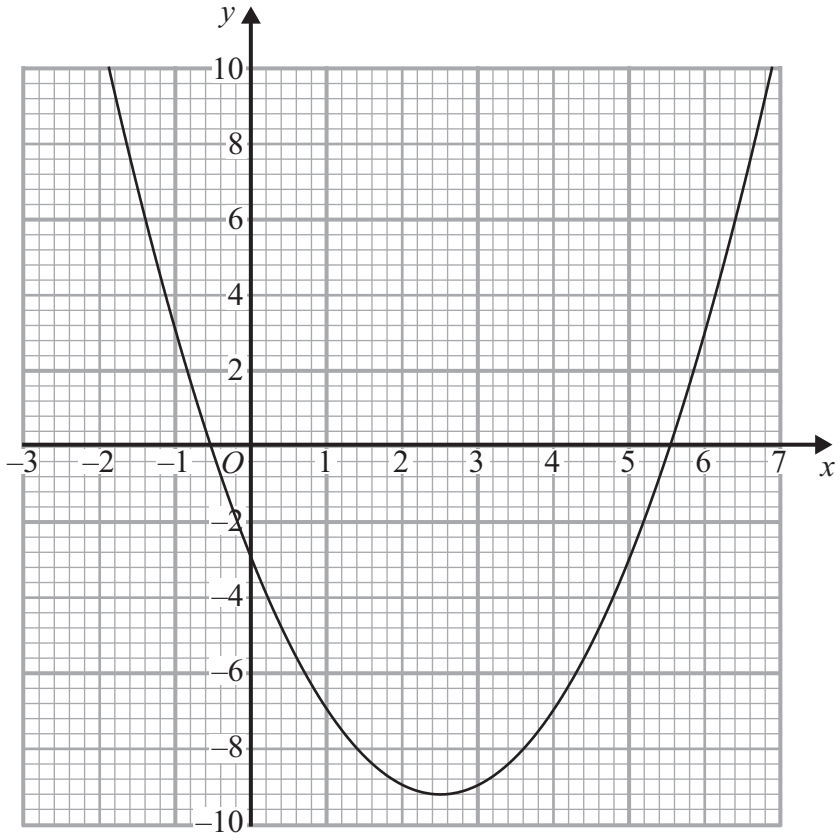
.....

(2) **Q10**

(Total 4 marks)

Leave blank

11. The diagram shows the graph of $y = x^2 - 5x - 3$



(a) Use the graph to find estimates for the solutions of

(i) $x^2 - 5x - 3 = 0$

.....

(ii) $x^2 - 5x - 3 = 6$

.....

(3)

(b) Use the graph to find estimates for the solutions of the simultaneous equations

$y = x^2 - 5x - 3$

$y = x - 4$

.....

(3)

Q11

(Total 6 marks)

Leave blank

12. $y = p - 2qx^2$

$p = -10$
$q = 3$
$x = -5$

(a) Work out the value of y.

.....

(2)

(b) Rearrange $y = p - 2qx^2$

to make x the subject of the formula.

.....

(3) **Q12**

(Total 5 marks)

Leave blank

13.

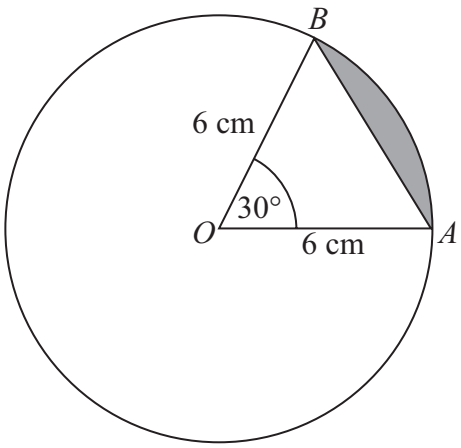


Diagram **NOT** accurately drawn

The diagram shows a circle, centre O.
A and B are points on the circle.
$OA = OB = 6$ cm.

The value of $\sin 30° = \frac{1}{2}$

Work out the area of the shaded segment.
Give your answer in terms of π.

..... cm^2 **Q13**

(Total 4 marks)

Leave blank

14.

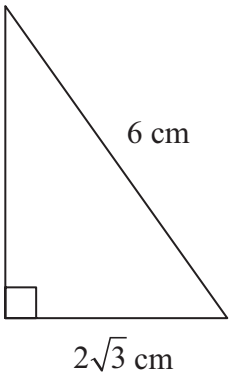


Diagram **NOT** accurately drawn

The diagram shows a right-angled triangle.

The length of the base of the triangle is $2\sqrt{3}$ cm.

The length of the hypotenuse of the triangle is 6 cm.

The area of the triangle is A cm^2.

Show that $A = k\sqrt{2}$ giving the value of k.

.....

Q14

(Total 5 marks)

TOTAL FOR PAPER: 60 MARKS

END