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

Paper Reference(s)

5384H/14H

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics (Modular) – 2381

Paper 14 (Calculator)

Higher Tier

Unit 3

Monday 1 June 2009 – Morning

Time: 1 hour 10 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 60.
There are 20 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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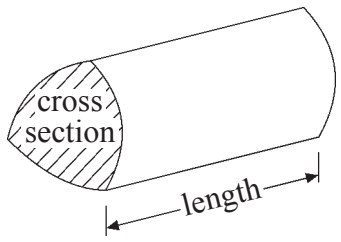
GCSE Mathematics

Formulae: Higher Tier

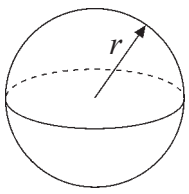
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length



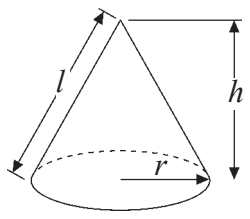
Volume of sphere $= \frac{4}{3}\pi r^3$

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

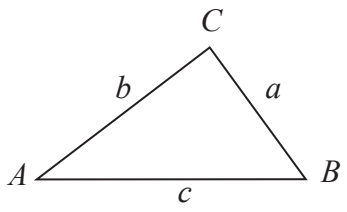


Volume of cone $= \frac{1}{3}\pi r^2 h$

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



In any triangle ABC



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

Leave blank

Answer ALL SEVENTEEN questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. Tania went to Italy.
She changed £325 into euros (€).

The exchange rate was £1 = €1.68

(a) Change £325 into euros (€).

€ .....
(2)

When she came home she changed €117 into pounds.

The new exchange rate was £1 = €1.50

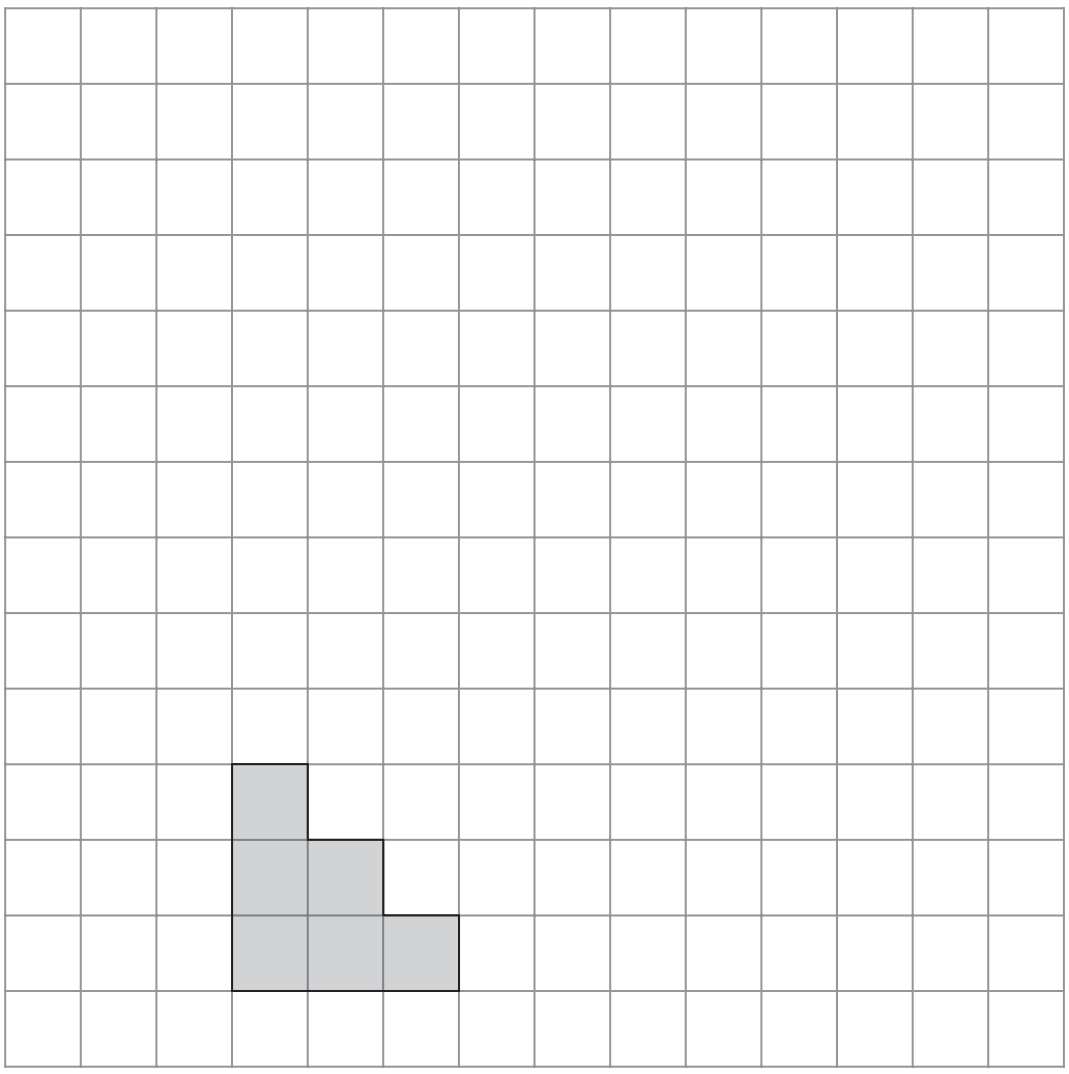
(b) Change €117 into pounds.

£ .....
(2) **Q1**

(Total 4 marks)

Leave blank

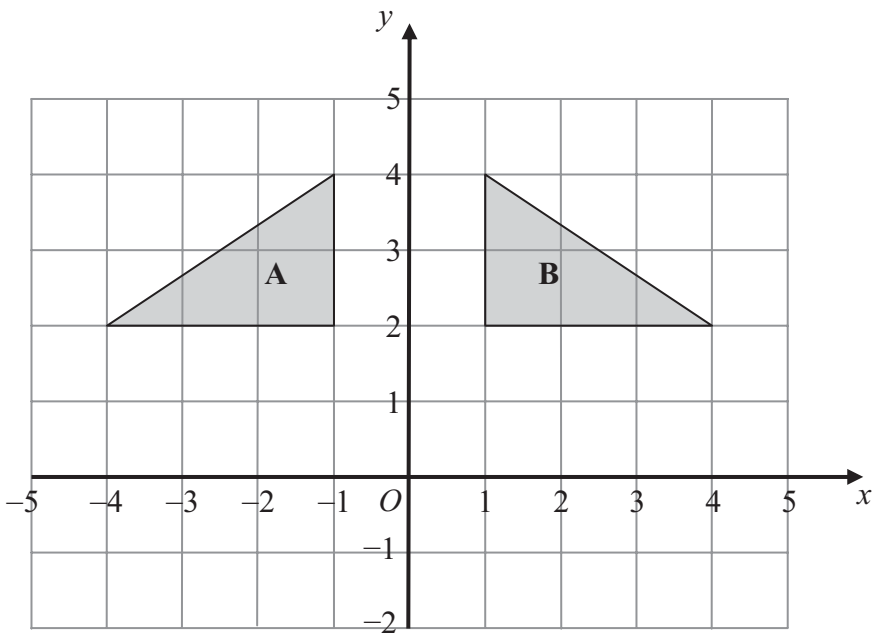
2.



(a) On the grid, draw an enlargement, scale factor 2, of the shaded shape.

(2)

Leave blank



(b) Describe fully the single transformation that maps triangle **A** onto triangle **B**.

.....

(2) **Q2**

(Total 4 marks)

3. Julie buys 19 identical calculators.
The total cost is £143.64

Work out the total cost of 31 of these calculators.

£ **Q3**

(Total 3 marks)

Turn over

Leave blank

4. $F = 1.8C + 32$

(a) Work out the value of F when $C = -8$

.....

(2)

(b) Work out the value of C when $F = 68$

.....

(2) **Q4**

(Total 4 marks)

Leave blank

5. There are some sweets in a bag.

18 of the sweets are toffees.
12 of the sweets are mints.

(a) Write down the ratio of the number of toffees to the number of mints.
Give your ratio in its simplest form.

..... : .....

(2)

There are some oranges and apples in a box.
The total number of oranges and apples is 54
The ratio of the number of oranges to the number of apples is 1 : 5

(b) Work out the number of apples in the box.

.....

(2)

Q5

(Total 4 marks)

Leave blank

6. The equation

$$x^3 + 20x = 71$$

has a solution between 2 and 3

Use a trial and improvement method to find this solution.
Give your answer correct to one decimal place.
You must show **ALL** your working.

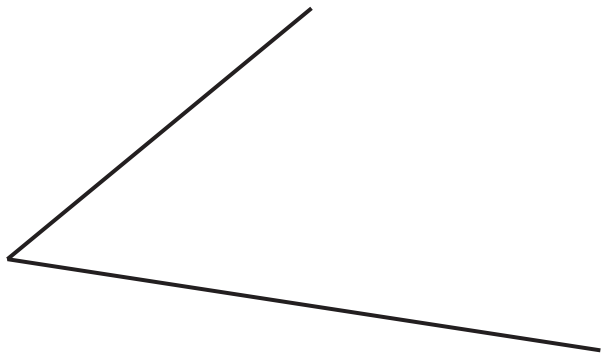
$x =$ .....

Q6

(Total 4 marks)

Leave blank

7. Use ruler and compasses to **construct** the bisector of this angle.
You must show all your construction lines.



Q7

(Total 2 marks)

8. Here is a tile in the shape of a semicircle.

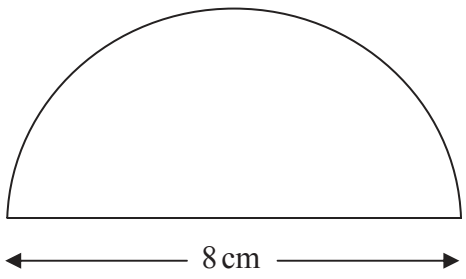


Diagram **NOT** accurately drawn

The diameter of the semicircle is 8 cm.

Work out the perimeter of the tile.
Give your answer correct to 2 decimal places.

..... cm

Q8

(Total 3 marks)

Leave blank

9. Work out $\dfrac{4.6+3.85}{3.2^2-6.51}$

Write down all the numbers on your calculator display.

.....

(Total 2 marks)

Q9

10. (a) Simplify $t^6 \times t^2$

.....

(1)

(b) Simplify $\dfrac{m^8}{m^3}$

.....

(1)

(c) Simplify $(2x)^3$

.....

(2)

(d) Simplify $3a^2h \times 4a^5h^4$

.....

(2)

(Total 6 marks)

Q10

Leave blank

11.

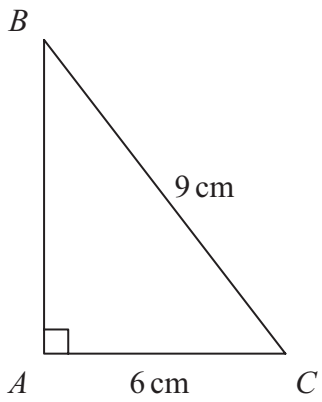


Diagram **NOT** accurately drawn

ABC is a right-angled triangle.

AC = 6 cm.
BC = 9 cm.

Work out the length of *AB*.
Give your answer correct to 3 significant figures.

..... cm

Q11

(Total 3 marks)

Turn over

Leave blank

12. Toby invested £4500 for 2 years in a savings account.
He was paid 4% per annum compound interest.

How much did Toby have in his savings account after 2 years?

£ .....

(Total 3 marks)

Q12

Leave blank

13. Here is a right-angled triangle.

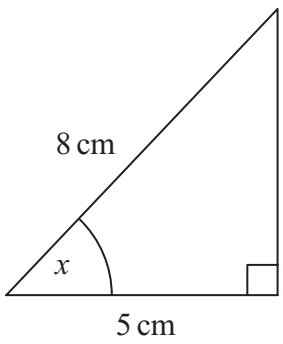


Diagram **NOT** accurately drawn

Calculate the size of the angle marked x.
Give your answer correct to 1 decimal place.

x = ... °

Q13

(Total 3 marks)

14. P is inversely proportional to d^2.

$P = 10\,000$ when $d = 0.4$

Find the value of P when $d = 0.8$

P = ...

Q14

(Total 3 marks)

Leave blank

15. (a) Solve $x^2 - 2x - 1 = 0$

Give your solutions correct to 2 decimal places.

.....

(3)

(b) Write down the solutions, correct to 2 decimal places, of $3x^2 - 6x - 3 = 0$

.....

(1)

Q15

(Total 4 marks)

Leave blank

16.

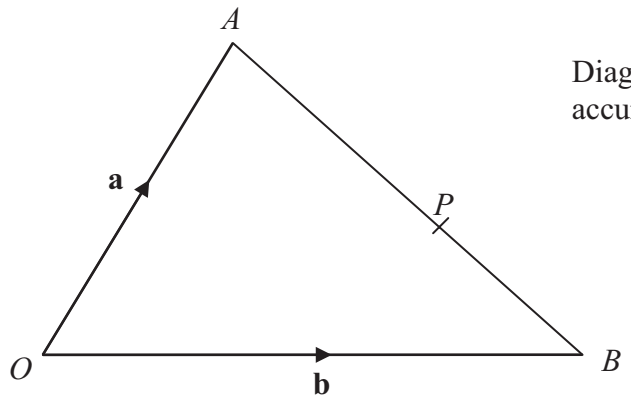


Diagram **NOT** accurately drawn

OAB is a triangle.

$\overrightarrow{OA} = \mathbf{a}$

$\overrightarrow{OB} = \mathbf{b}$

(a) Find the vector $\overrightarrow{AB}$ in terms of **a** and **b**.

$\overrightarrow{AB}$ = ...

(1)

P is the point on AB such that $AP : PB = 3 : 2$

(b) Show that $\overrightarrow{OP} = \frac{1}{5}(2\mathbf{a} + 3\mathbf{b})$

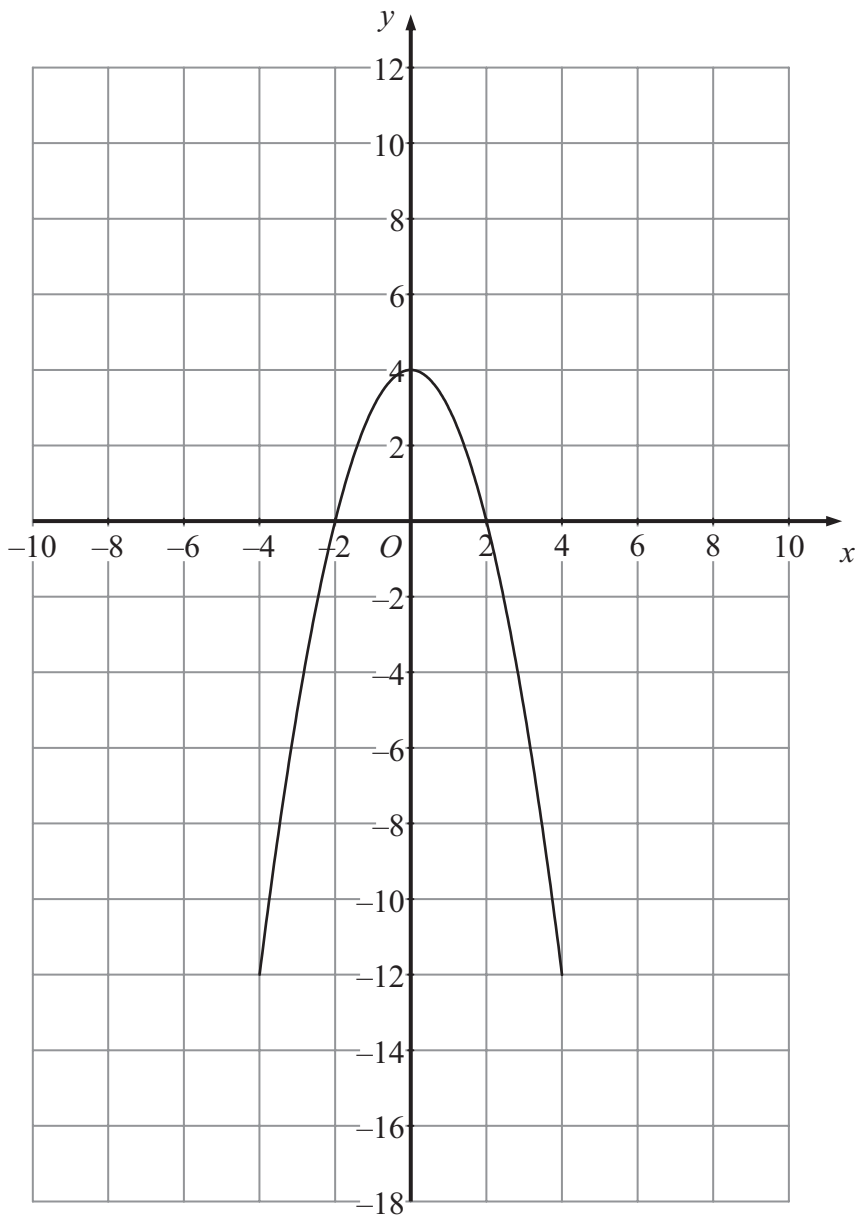
(3) **Q16**

(Total 4 marks)

Leave blank

17. The graph of $y = f(x)$ is shown on the grids.

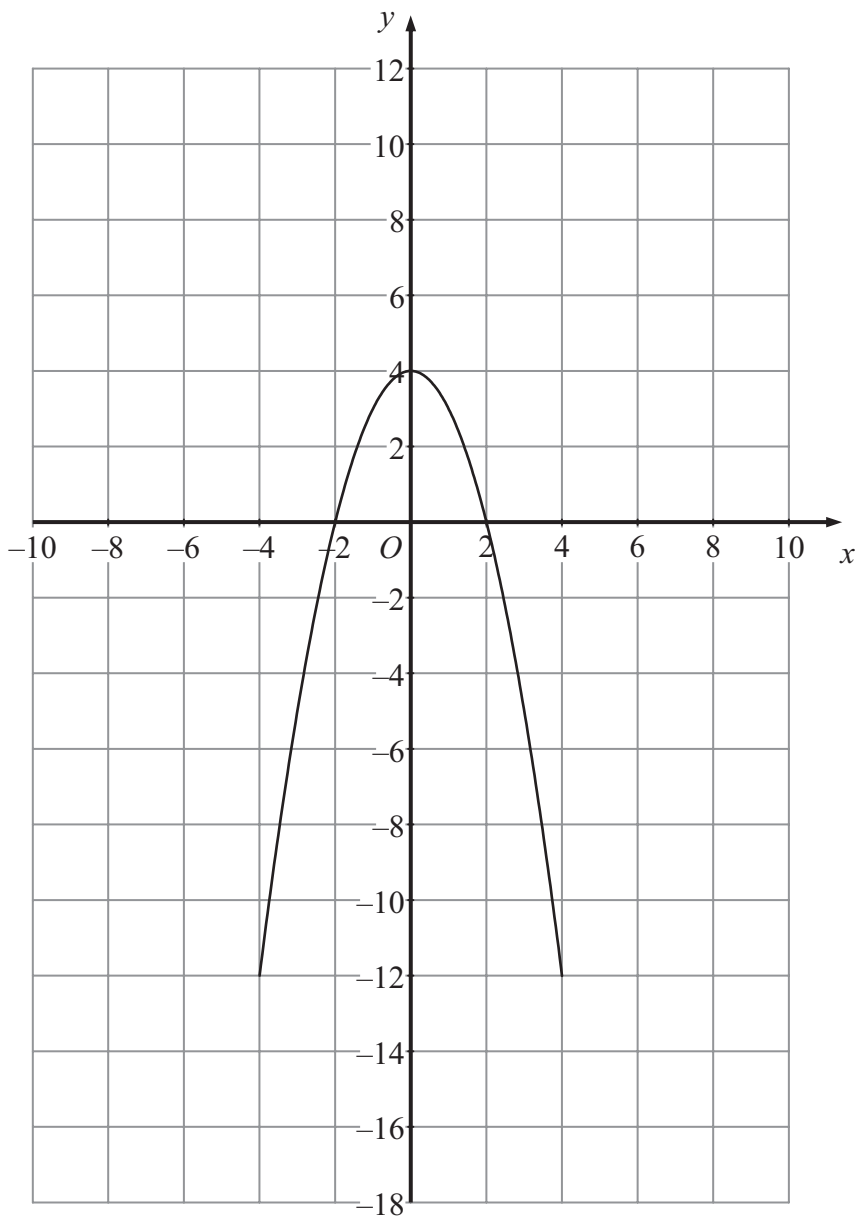
(a) On this grid, sketch the graph of $y = f(x) - 4$



(2)

Leave blank

(b) On this grid, sketch the graph of $y = f(\frac{1}{2}x)$.



(2) **Q17**

(Total 4 marks)

TOTAL FOR PAPER: 60 MARKS

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