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 6 June 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 18 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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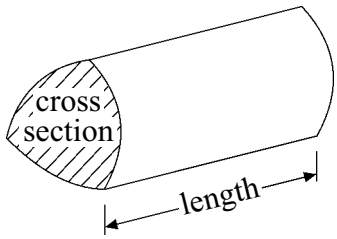
GCSE Mathematics

Formulae: Higher Tier

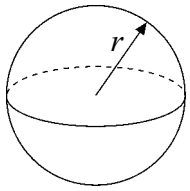
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length



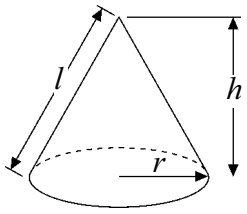
Volume of sphere $= \frac{4}{3}\pi r^3$

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

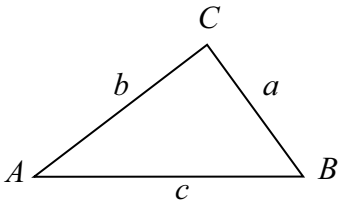


Volume of cone $= \frac{1}{3}\pi r^2 h$

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 EIGHTEEN 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 **10** Flapjacks.

Ingredients for 10 Flapjacks
80 g rolled oats
60 g butter
30 m*l* golden syrup
36 g light brown sugar

Work out the amount of each ingredient needed to make **15** Flapjacks.

..... g rolled oats

..... g butter

..... m*l* golden syrup

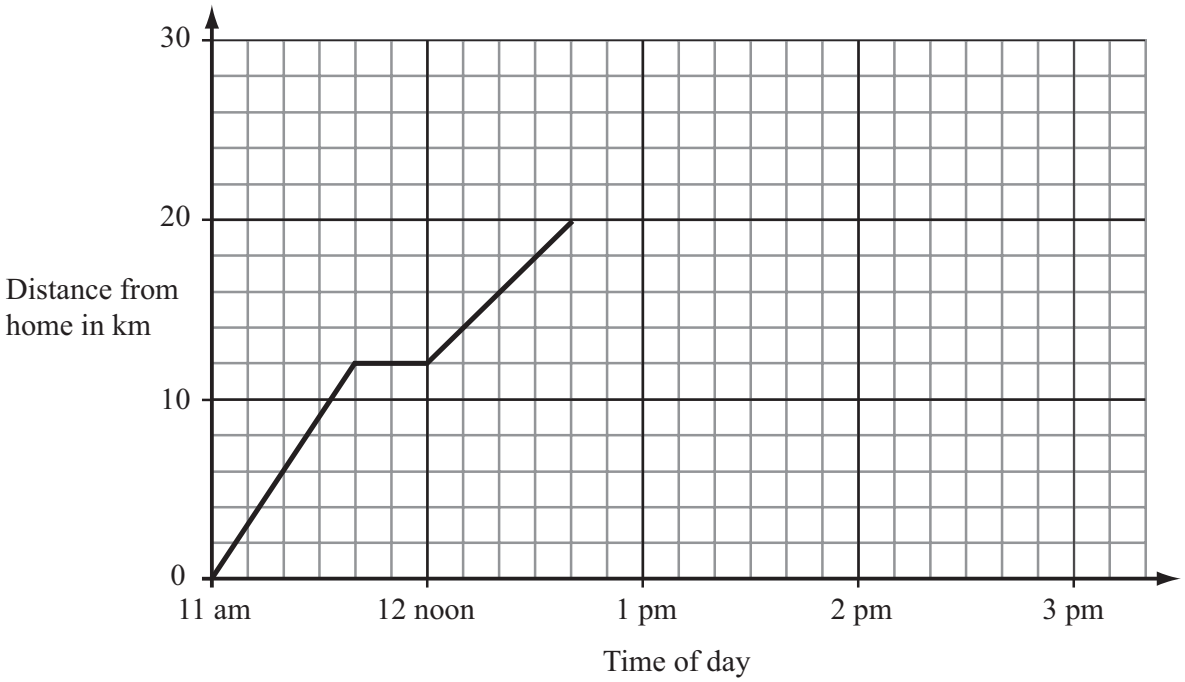
..... g light brown sugar

(Total 3 marks)

Q1

Leave blank

2. Steve went for a cycle ride.
He left home at 11 am.
The travel graph shows part of Steve's journey.



At 11.40 am Steve stopped to have a drink.

(a) For how many minutes did he stop?

..... minutes
(1)

(b) What was Steve's distance from home at 12.30 pm?

..... km
(1)

At 12.40 pm Steve stopped to have lunch for 40 minutes.
He then cycled home at a steady speed.
It took him 1 hour 30 minutes to cycle home.

(c) Complete the travel graph.

(2)

(Total 4 marks)

Q2

Leave blank

3. $H = 2a + 3b$
$a = 5$
$b = -1$

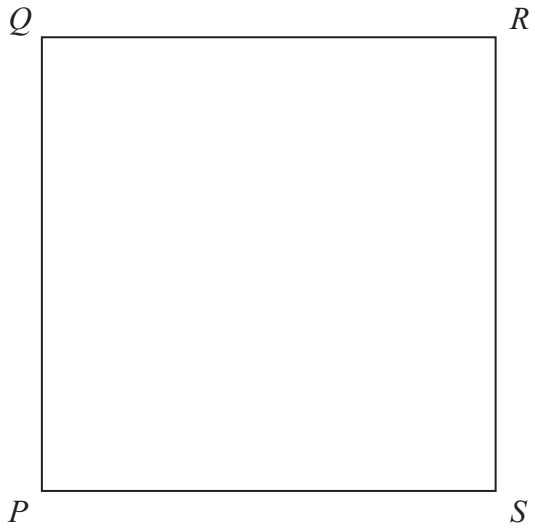
Work out the value of H.

.....

Q3

(Total 2 marks)

4.



$PQRS$ is a square.

Shade the set of points inside the square which are **both**

more than 3 centimetres from the point P
and less than 2 centimetres from the line PS.

Q4

(Total 3 marks)

5. Write down the reciprocal of 8

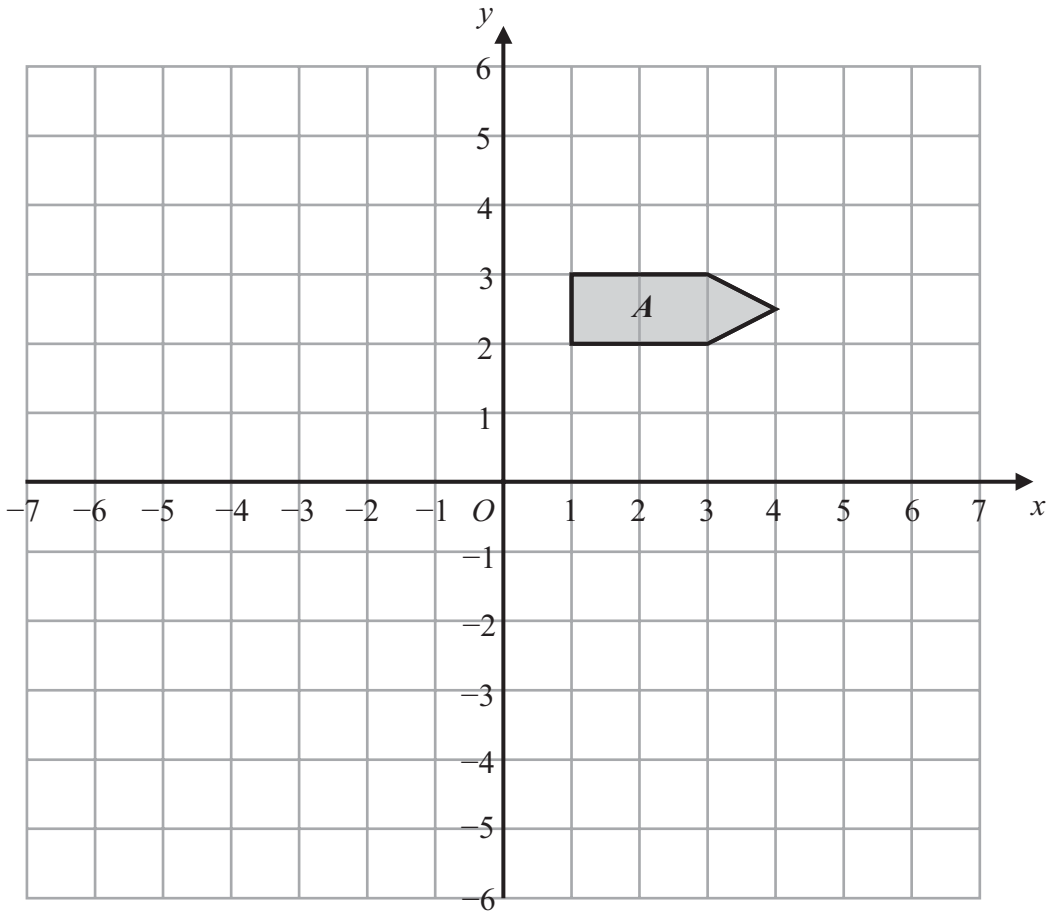
.....

Q5

(Total 1 mark)

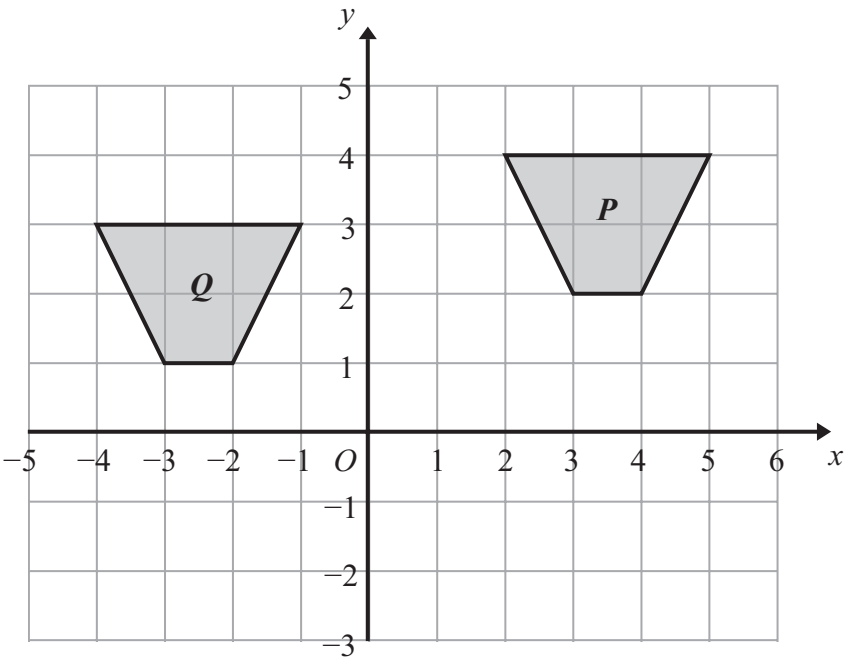
Leave blank

6.



(a) On the grid above, reflect shape ***A*** in the line $x = -1$

(2)



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

.....

.....

Q6

(2)

(Total 4 marks)

Leave blank

7. Callum says

"4 m^2 is equivalent to 400 cm^2."

Is Callum correct?
Give reasons for your answer.

.....

.....

.....

Q7

(Total 2 marks)

8. Peter, Tarish and Ben share £54

Tarish gets three times as much money as Peter.
Ben gets twice as much money as Tarish.

How much money does Ben get?

£ .....

Q8

(Total 3 marks)

Leave blank

9. In the year 1958 a school had 250 students.
In the year 2008 the school had 1500 students.

Work out the percentage increase in the number of students between the year 1958 and the year 2008

..... %

(Total 3 marks)

Q9

10.

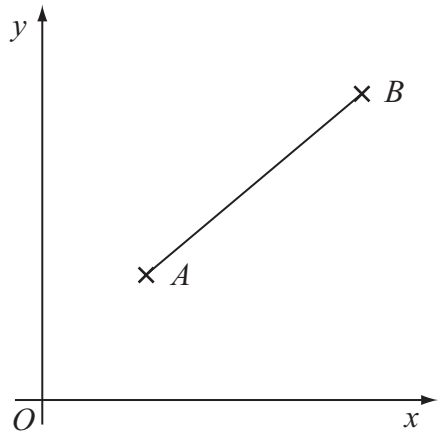


Diagram **NOT** accurately drawn

A is the point (2, 3).
B is the point (6, 6).

Work out the length of *AB*.

.....

(Total 3 marks)

Q10

Leave blank

11. (a) Work out $\frac{1}{5} \times \frac{2}{3}$

.....

(1)

(b) Work out $2\frac{1}{3} - 1\frac{2}{5}$

.....

(3) **Q11**

(Total 4 marks)

Leave blank

12. (a) Work out the value of $\frac{3^7}{3^5}$

.....

(1)

(b) Find the value of 2^{-3}

.....

(1)

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

.....

(1)

(d) Simplify $\frac{n^4}{n^3 \times n^2}$

.....

(2)

Q12

(Total 5 marks)

Leave blank

13. Solve the simultaneous equations

$$4x + y = 10$$
$$2x - 3y = 19$$

$x =$ .....

$y =$ .....

(Total 3 marks)

Q13

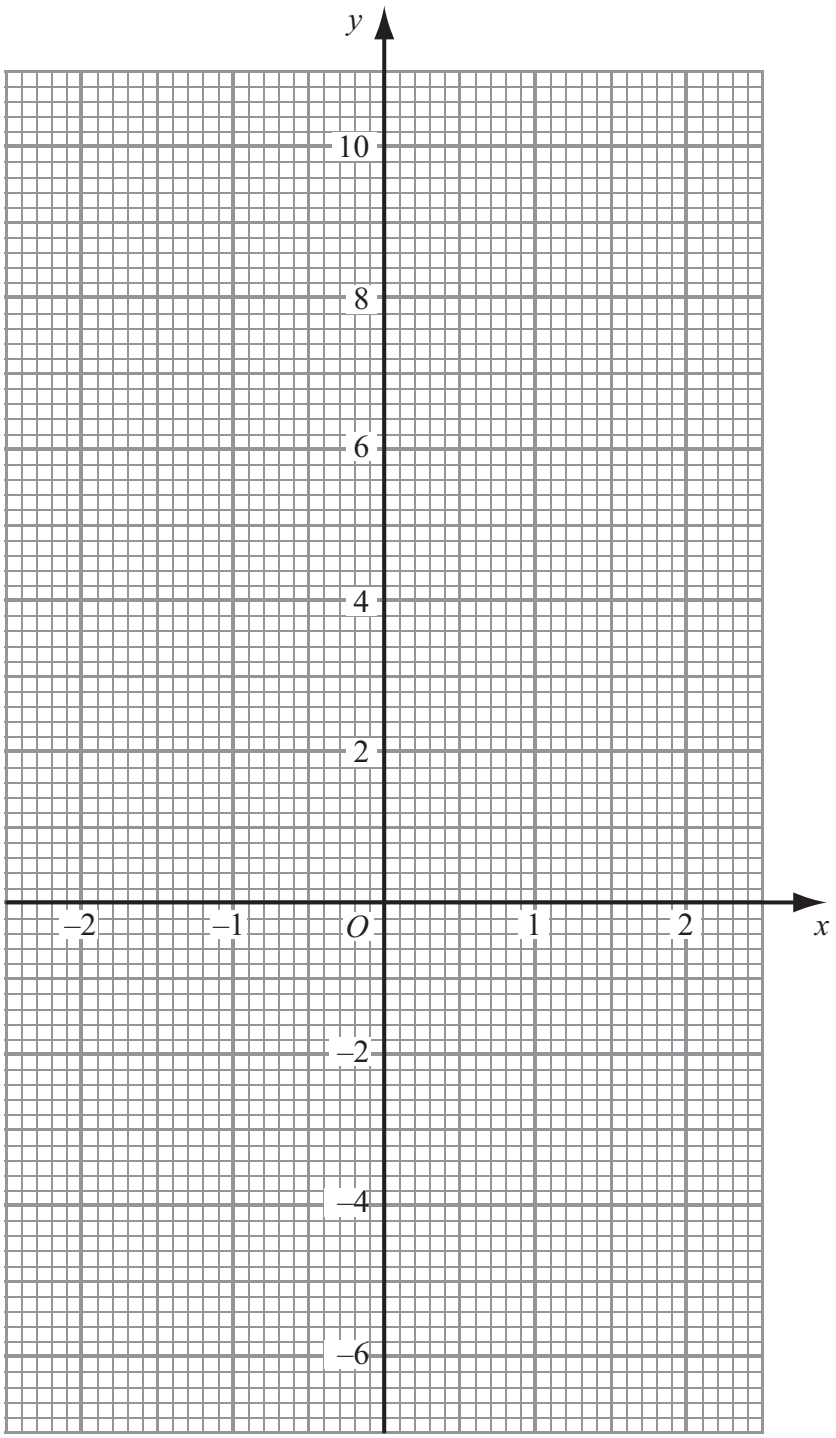
Leave blank

14. (a) Complete the table of values for $y = 2 - x^3$

x	−2	−1	0	1	2
y	10			1	

(2)

(b) On the grid, draw the graph of $y = 2 - x^3$



(2)

Q14

(Total 4 marks)

Leave blank

15. Make k the subject of the formula $t = \dfrac{k}{k-2}$

.....

Q15

(Total 4 marks)

Leave blank

16.

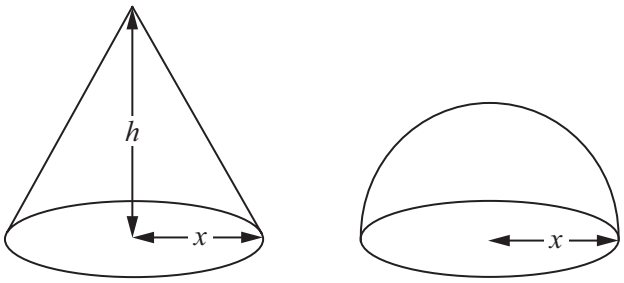


Diagram **NOT** accurately drawn

The diagram shows a solid cone and a solid hemisphere.

The cone has a base of radius x cm and a height of h cm.
The hemisphere has a base of radius x cm.
The surface area of the cone is equal to the surface area of the hemisphere.

Find an expression for h in terms of x.

.....

Q16

(Total 4 marks)

Leave blank

17.

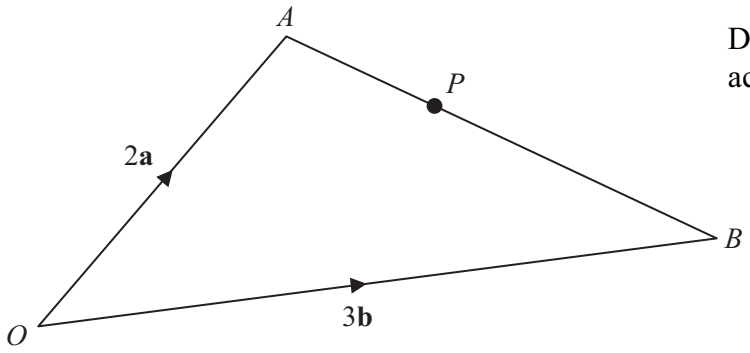


Diagram **NOT** accurately drawn

OAB is a triangle.

$\overrightarrow{OA} = 2\mathbf{a}$

$\overrightarrow{OB} = 3\mathbf{b}$

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

$\overrightarrow{AB}$ = ...

(1)

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

(b) Show that $\overrightarrow{OP}$ is parallel to the vector **a** + **b**.

(3) **Q17**

(Total 4 marks)

Leave blank

18. Solve the equation $\frac{x}{2} - \frac{2}{x+1} = 1$

.....

Q18

(Total 4 marks)

TOTAL FOR PAPER: 60 MARKS

END