Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.						5	5	3	8	/	1	9	Signature	

Paper Reference(s)

5538/19

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics B – 1388

Paper 19 (Calculator)

Higher Tier

Wednesday 15 June 2005 – 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 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

There are 15 questions in this paper. The total mark for this paper is 62.
The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
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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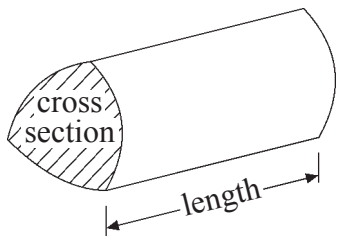
edexcel

GCSE Mathematics 1387/8

Formulae: Higher Tier

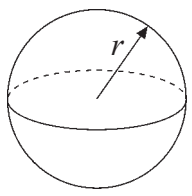
You must not write on this page.
Anything you write on this page will gain NO credit.

Volume of a prism = area of cross section × length



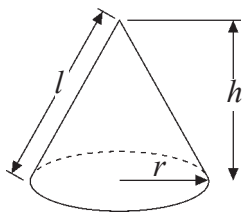
Volume of sphere $= \frac{4}{3}\pi r^3$

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

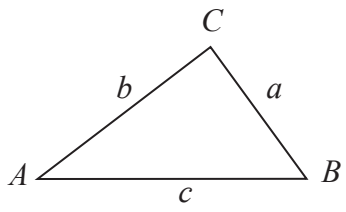


Volume of cone $= \frac{1}{3}\pi r^2 h$

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 FIFTEEN questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. (a) Make t the subject of the formula $v = u + 5t$

$t =$ .....

(2)

(b) Solve $\frac{x-3}{5} = x - 5$

$x =$ .....

(3)

(Total 5 marks)

Q1

2. Use your calculator to work out the value of $\frac{1}{2.73^2 - 3.86}$

(a) Write down all the figures on your calculator display.

.....

(2)

(b) Give your answer to an appropriate degree of accuracy.

.....

(1)

(Total 3 marks)

Q2

Leave blank

3. The table shows information about the number of hours that 120 children used a computer last week.

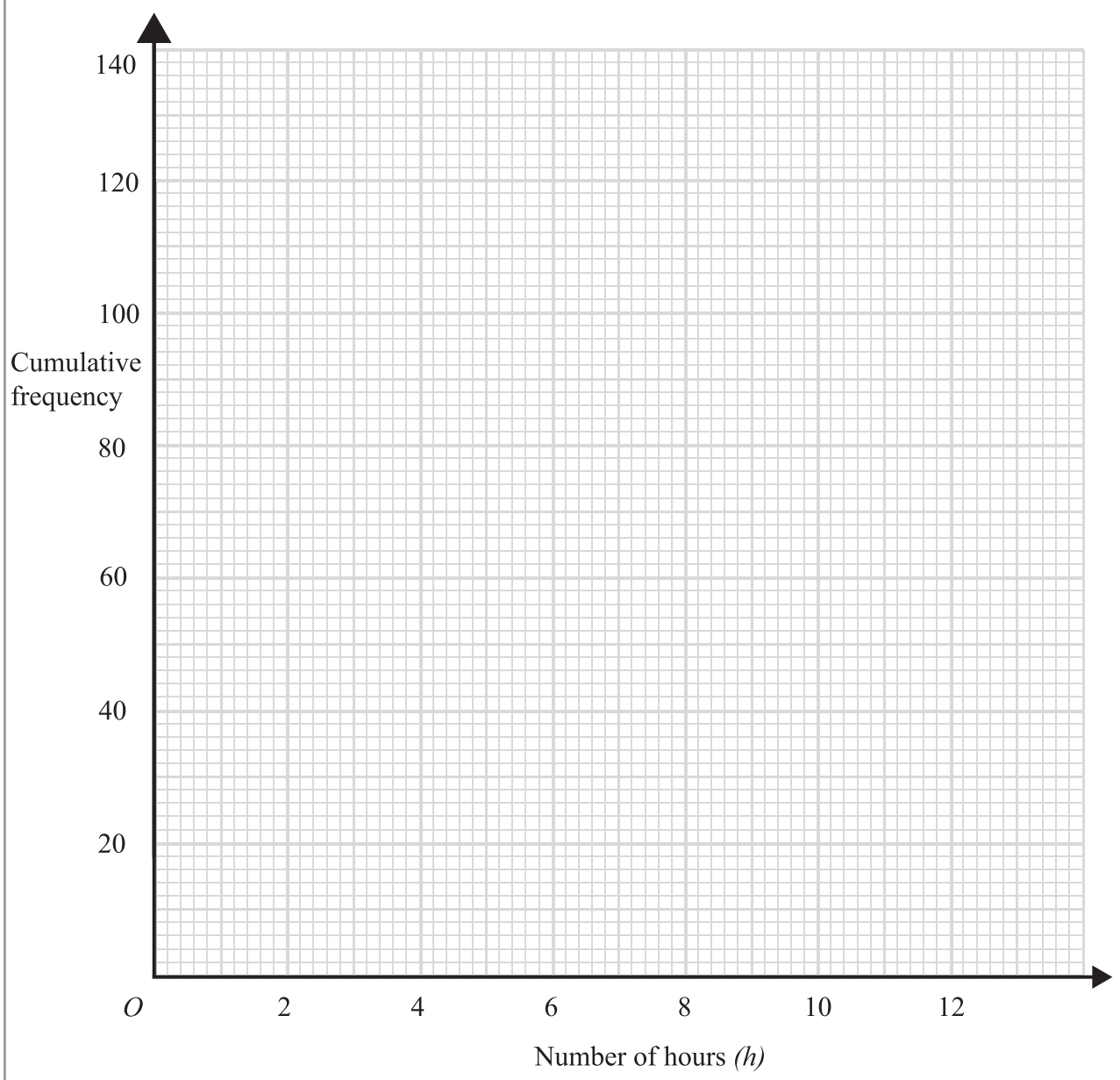
Number of hours *(h)*	Frequency
$0 < h \leqslant 2$	10
$2 < h \leqslant 4$	15
$4 < h \leqslant 6$	30
$6 < h \leqslant 8$	35
$8 < h \leqslant 10$	25
$10 < h \leqslant 12$	5

(a) Complete the cumulative frequency table.

Number of hours *(h)*	Cumulative frequency
$0 < h \leqslant 2$	10
$0 < h \leqslant 4$	
$0 < h \leqslant 6$	
$0 < h \leqslant 8$	
$0 < h \leqslant 10$	
$0 < h \leqslant 12$	

(1)

Leave blank



(b) On the grid, draw a cumulative frequency graph for your table.

(2)

(c) Use your graph to find an estimate for the number of children who used a computer for **less** than 7 hours last week.

.....

(2)

(Total 5 marks)

Q3

Leave blank

4.

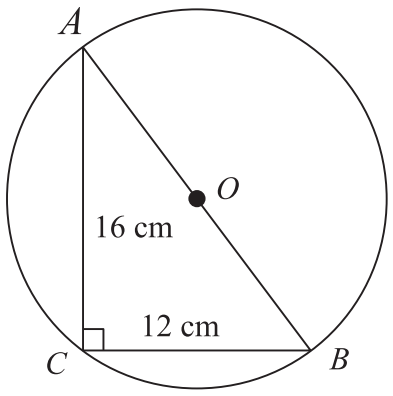


Diagram **NOT** accurately drawn

The diagram shows triangle ABC and a circle, centre O.
A, B and C are points on the circumference of the circle.
AB is a diameter of the circle.

$AC = 16$ cm and $BC = 12$ cm.

(a) Angle $ACB = 90°$.
Give a reason why.

.....

(1)

(b) Work out the diameter AB of the circle.

.....cm

(3)

(c) Work out the area of the circle.
Give your answer correct to 3 significant figures.

.....cm^2

(3)

(Total 7 marks)

Q4

Leave blank

5. Work out $(3.2\times10^6)\times(4.5\times10^4)$

Give your answer in standard form correct to 2 significant figures.

.....

(Total 2 marks)

Q5

6. Bill invests £500 on 1st January 2004 at a compound interest rate of R% per annum.

The value, £V, of this investment after n years is given by the formula

$$V = 500\times(1.045)^n$$

(a) Write down the value of R.

R =.....

(1)

(b) Use your calculator to find the value of Bill's investment after 20 years.

£.....

(2)

(Total 3 marks)

Q6

Leave blank

7. $P = \pi r + 2r + 2a$

$P = 84$
$r = 6.7$

Work out the value of a.
Give your answer correct to 3 significant figures.

$a =$ .....

(Total 3 marks)

Q7

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

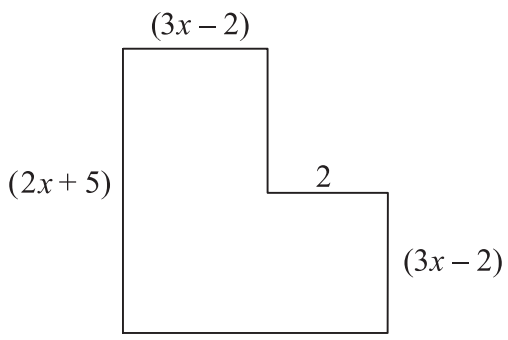


Diagram **NOT** accurately drawn

The area of the shape is 25 cm^2.

Show that $6x^2 + 17x - 39 = 0$

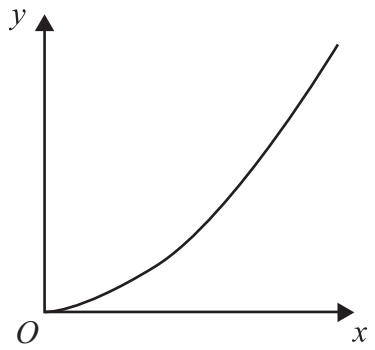
(Total 3 marks)

Q8

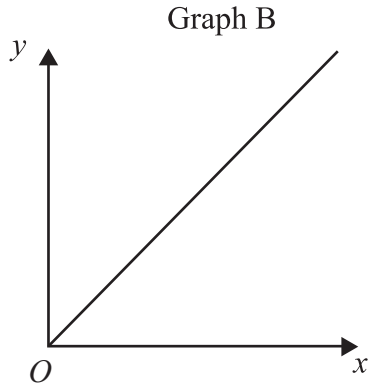
Leave blank

9.

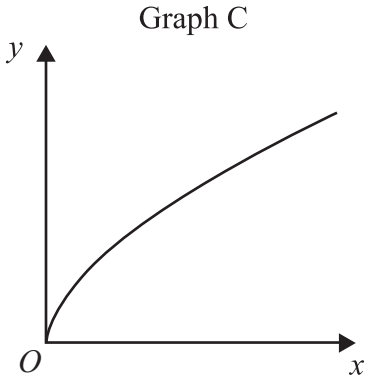
Graph A



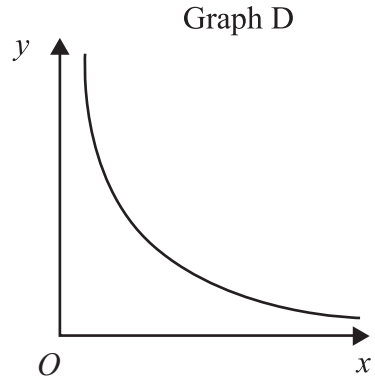
Graph B



Graph C



Graph D



For $k > 0$ each graph matches with one of the equations,

$y = kx$ $\quad y = k\sqrt{x}$ $\quad y = \frac{k}{x}$ $\quad y = kx^2$

Match each graph to its equation

Equation	Graph
$y = kx$	
$y = k\sqrt{x}$	
$y = \frac{k}{x}$	
$y = kx^2$	

Q9

(Total 3 marks)

Leave blank

10. The diagram shows a pyramid. The apex of the pyramid is V.
Each of the sloping edges is of length 6 cm.

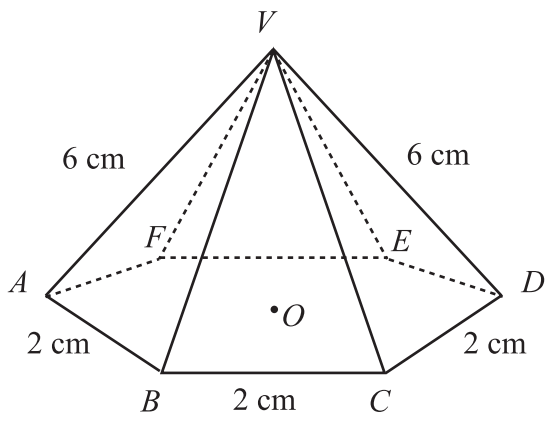


Diagram **NOT** accurately drawn

The base of the pyramid is a regular hexagon with sides of length 2 cm.
O is the centre of the base.

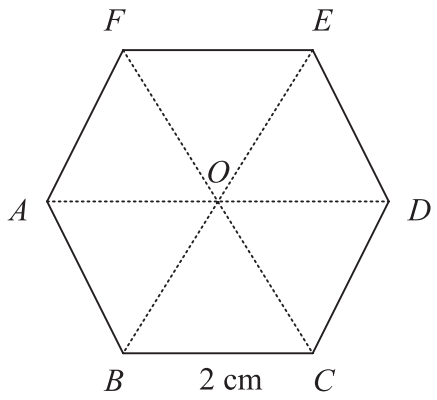


Diagram **NOT** accurately drawn

(a) Calculate the height of V above the base of the pyramid.
Give your answer correct to 3 significant figures.

…….cm
(2)

Leave blank

(b) Calculate the size of angle *DVA*.
Give your answer correct to 3 significant figures.

……..°
(3)

(c) Calculate the size of angle *AVC*.
Give your answer correct to 3 significant figures.

……..°
(4)

(Total 9 marks)

Q10

Leave blank

11. The table shows some information about the pupils at Statson School.

Year group	Boys	Girls	Total
Year 7	104	71	175
Year 8	94	98	192
Year 9	80	120	200
Total	278	289	567

Kelly carries out a survey of the pupils at Statson School.
She takes a sample of 80 pupils, stratified by both Year group and gender.

(a) Work out the number of Year 8 boys in her sample.

.....

(2)

(b) (i) Explain what is meant by a random sample.

.....

.....

.....

(ii) Describe a method that Kelly could use to take a random sample of Year 8 boys.

.....

.....

.....

.....

(2)

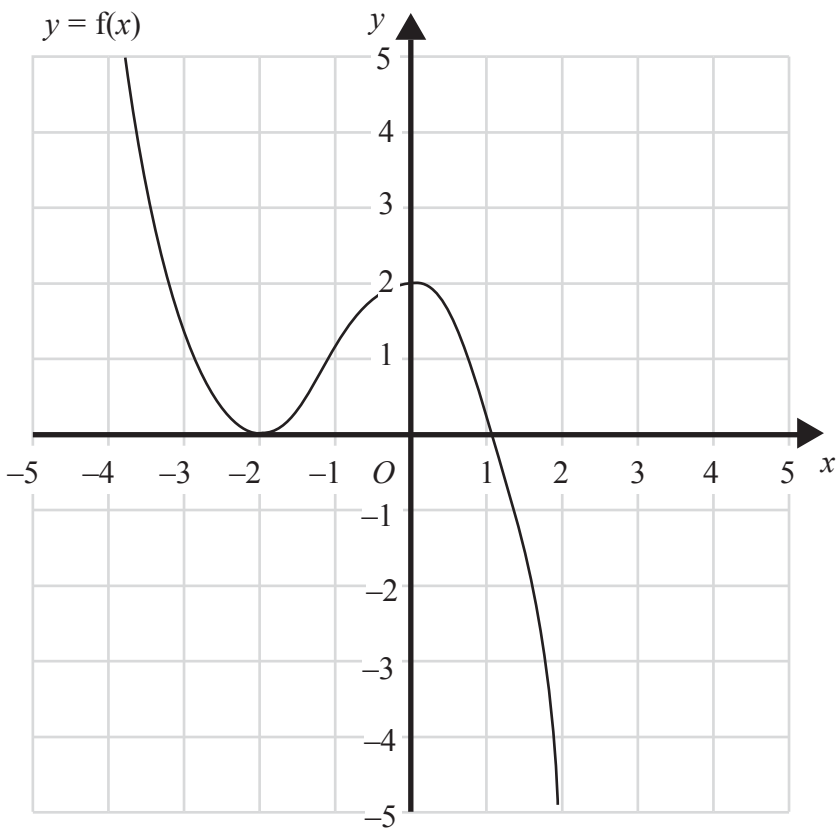
(Total 4 marks)

Q11

Leave blank

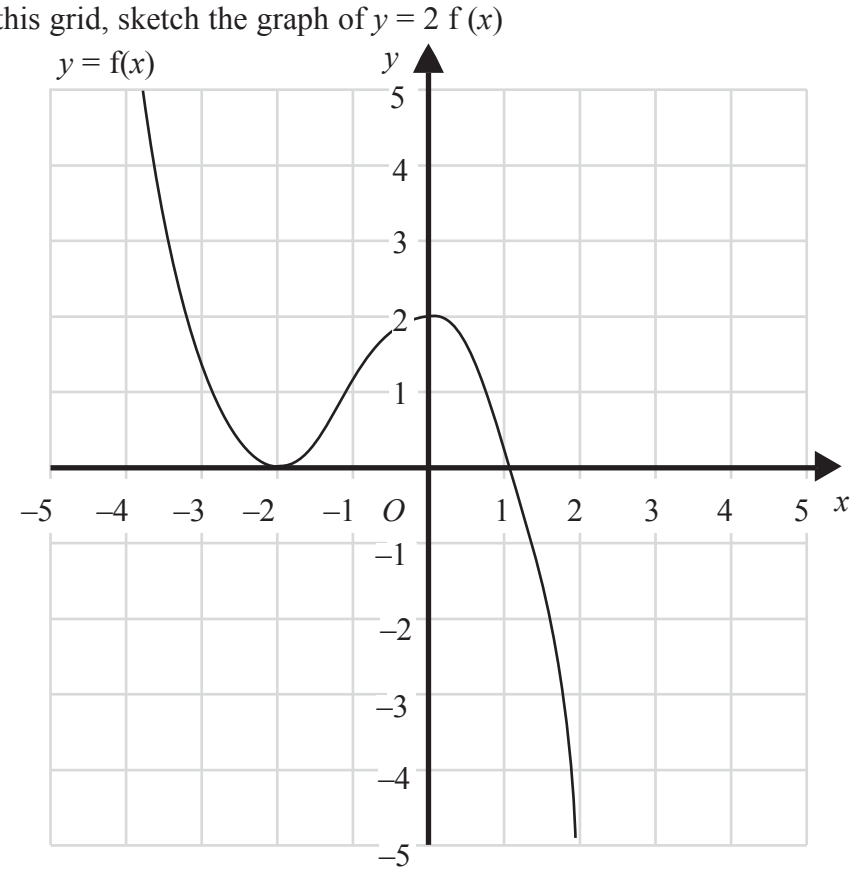
12. The graph of $y = f(x)$ is shown on the grids.

(a) On this grid, sketch the graph of $y = f(x - 1)$



(2)

(b) On this grid, sketch the graph of $y = 2f(x)$



(2)

(Total 4 marks)

Q12

Leave blank

13. Simplify fully $\left(3xy^2\right)^4$

.....

Q13

(Total 2 marks)

14. Write $\dfrac{\sqrt{18}+10}{\sqrt{2}}$ in the form $p + q\sqrt{2}$, where p and q are integers.

p = ...

q = ...

Q14

(Total 2 marks)

Leave blank

15. By eliminating x, find the solutions to the simultaneous equations

$$x - 2y = 1$$
$$x^2 + y^2 = 13$$

$x =$ ……, $y =$ ……

or $x =$ ……, $y =$ ……

Q15

(Total 7 marks)

TOTAL FOR PAPER: 62 MARKS

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