Centre No.						Paper Reference (complete below)							Surname	Initial(s)
Candidate No.						5	5	0	4	/	0	4	Signature	

Examiner's use only

Team Leader's use only

Paper Reference(s)

5504/04

Edexcel GCSE

Mathematics A – 1387

Paper 4 (Calculator)

Intermediate Tier

Tuesday 10 June 2003 – Morning

Time: 2 hours

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
Formulae sheet

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initial(s) and your signature.
Check that you have the correct question paper.
Answer **ALL** the questions in the spaces provided in this question paper.
Supplementary answer sheets may be used.

Information for Candidates

The total mark for this paper is 100.
The marks for individual questions and 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.
This paper has 22 questions. There are no blank pages.

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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Answer ALL TWENTY TWO Questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

Leave blank

1. (a) Use your calculator to work out

$$(2.3 + 1.8)^2 \times 1.07$$

Write down all the figures on your calculator display.

.....

(2)

(b) Put brackets in the expression below so that its value is 45.024

$$1.6 + 3.8 \times 2.4 \times 4.2$$

(1)

2. Simon repairs computers.
He charges

£56.80 for the first hour he works on a computer and
£42.50 for each extra hour's work.

Yesterday Simon repaired a computer and charged a total of £269.30

(a) Work out how many hours Simon worked yesterday on this computer.

.....

(2)

Simon reduces his charges by 5% when he is paid promptly.
He was paid promptly for yesterday's work on the computer.

(b) Work out how much he was paid.

£.....

(3)

Leave blank

Page Total

3.

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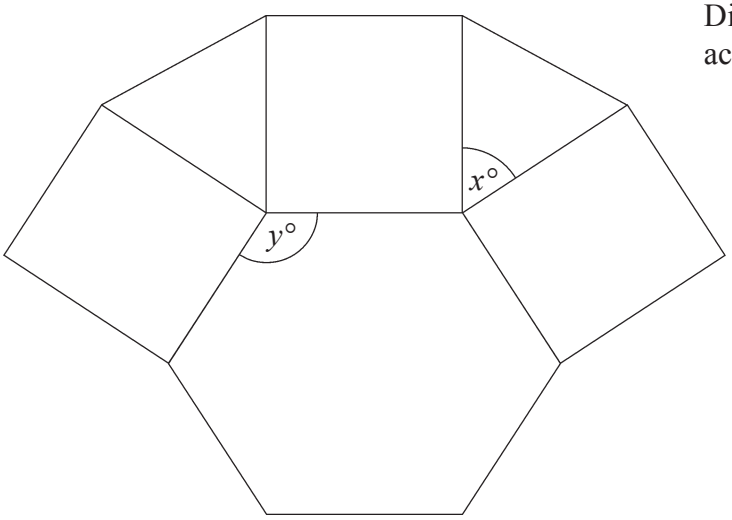

Diagram **NOT** accurately drawn

This is part of the design of a pattern found at the theatre of Diana at Alexandria.

It is made up of a regular hexagon, squares and equilateral triangles.

(a) Write down the size of the angle marked $x°$.

.....°

(1)

(b) Work out the size of the angle marked $y°$.

.....°

(2)

The area of each equilateral triangle is 2 cm^2.

(c) Work out the area of the regular hexagon.

.....cm^2

(2)

(d) In the space below, use ruler and compasses to **construct** an equilateral triangle with sides of length 4 centimetres.
You must show all construction lines.

Leave blank

(2)

Page Total

Leave blank

4. In 2002, Shorebridge Chess Club's total income came from a council grant and members' fees.

Council grant	£50
Members' fees	240 at £5 each.

(a) (i) Work out the total income of the club for the year 2002.

£.....

(ii) Find the council grant as a fraction of the club's total income for the year 2002.
Give your answer in its simplest form.

.....

(3)

In 2001, the club's total income was £1000.
The club spent 60% of its total income on a hall.
It spent a further £250 on prizes.

(b) Work out the ratio

The amount spent on the hall : the amount spent on prizes.

Give your answer in its simplest form.

.....

(3)

5.

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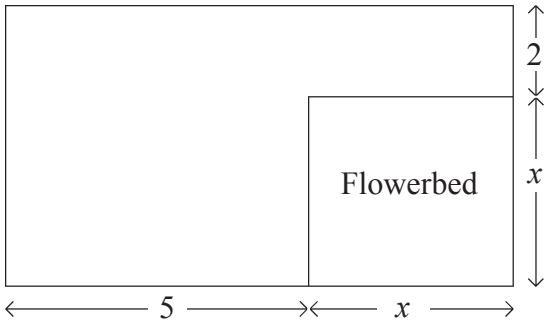


Diagram **NOT** accurately drawn

The diagram represents a garden in the shape of a rectangle.
All measurements are given in metres.
The garden has a flowerbed in one corner.
The flowerbed is a square of side x.

(a) Write down an expression, in terms of x, for the shortest side of the garden.

.....

(1)

(b) Find an expression, in terms of x, for the perimeter of the garden.
Give your answer in its simplest form.

.....

(2)

The perimeter of the garden is 20 metres.

(c) Find the value of x.

.....

(2)

Page Total

6. (a) Simplify $5p + 2q - 3p - 3q$

Leave blank

.....

(2)

$y = 5x - 3$

(b) Find the value of x when $y = 4$

$x =$.....

(2)

7. The table shows some rows of a number pattern.

Row 1	1	$= \frac{1 \times 2}{2}$
Row 2	$1 + 2$	$= \frac{2 \times 3}{2}$
Row 3	$1 + 2 + 3$	$= \frac{3 \times 4}{2}$
Row 4	$1 + 2 + 3 + 4$	
Row 8		

(a) In the table, complete row 4 of the number pattern.

(1)

(b) In the table, complete row 8 of the number pattern.

(1)

(c) Work out the sum of the first 100 whole numbers.

Leave blank

.....

(1)

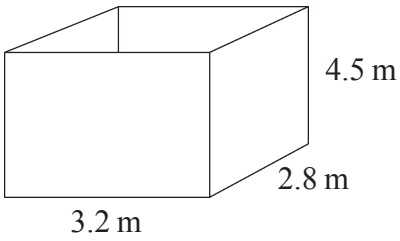
(d) Write down an expression, in terms of n, for the sum of the first n whole numbers.

.....

(2)

8.

Diagram **NOT** accurately drawn



The diagram represents a large tank in the shape of a cuboid.
The tank has a base.
It does not have a top.
The width of the tank is 2.8 metres.
The length of the tank is 3.2 metres.
The height of the tank is 4.5 metres.

The outside of the tank is going to be painted.
1 litre of paint will cover 2.5 m^2 of the tank.
The cost of the paint is £2.99 per litre.

Calculate the cost of the paint needed to paint the outside of the tank.

£.....

(5)

Page Total

9. Change $2.5m^2$ to cm^2

Leave blank

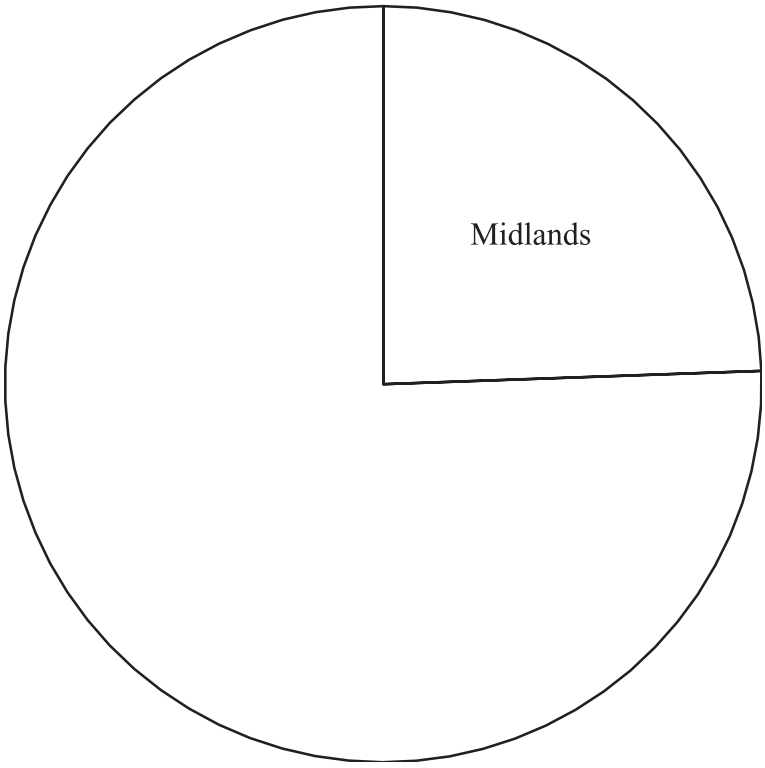
.....cm^2

(2)

10. Bhavana asked some people which region their favourite football team came from. The table shows her results.

Region	Frequency	
Midlands	22	
London	36	
Southern England	8	
Northern England	24	

(a) Complete the accurate pie chart to show these results.
Use the circle given below.



(3)

Four teams, City, Rovers, Town and United play a competition to win a cup.
Only one team can win the cup.

Leave blank

The table below shows the probabilities of City or Rovers or Town winning the cup.

City	Rovers	Town	United
0.38	0.27	0.15	x

(b) Work out the value of x.

.....

(2)

11. Here are the times, in minutes, taken to change some tyres.

5 10 15 12 8 7 20 35 24 15

20 33 15 25 10 8 10 20 16 10

In the space below, draw a stem and leaf diagram to show these times.

(3)

Page Total

12.

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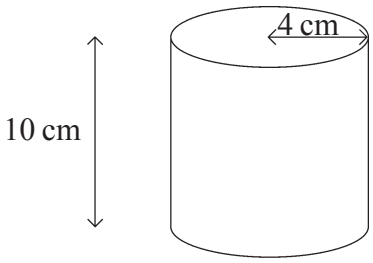

Diagram **NOT** accurately drawn

The diagram shows a cylinder with a height of 10 cm and a radius of 4 cm.

(a) Calculate the volume of the cylinder.
Give your answer correct to 3 significant figures.

.....cm^3

(2)

The length of a pencil is 13 cm.
The pencil cannot be broken.

(b) Show that this pencil cannot fit inside the cylinder.

(3)

13. (a) Express the following numbers as products of their prime factors.

Leave blank

(i) 60,

.....

(ii) 96.

.....

(4)

(b) Find the Highest Common Factor of 60 and 96.

.....

(1)

(c) Work out the Lowest Common Multiple of 60 and 96.

.....

(2)

Page Total

Leave blank

14. A garage keeps records of the costs of repairs to its customers' cars.
The table gives information about the costs of all repairs which were less than £250 in one week.

Cost, (£C)	Frequency
$0 < C \leqslant 50$	4
$50 < C \leqslant 100$	8
$100 < C \leqslant 150$	7
$150 < C \leqslant 200$	10
$200 < C \leqslant 250$	11

(a) Find the class interval in which the median lies.

.....

(2)

There was only one further repair that week, not included in the table.
That repair cost £1000.

Dave says 'The class interval in which the median lies will change.'

(b) Is Dave correct? Explain your answer.

.....

.....

(1)

The garage also sells cars.
It offers a discount of 20% off the normal price for cash.

Dave pays £5200 cash for a car.

(c) Calculate the normal price of the car.

£.....

(3)

15.

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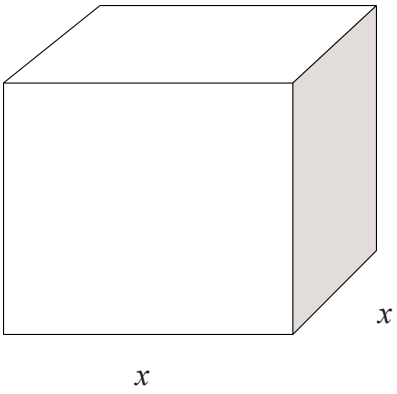

A cuboid has a square base of side x cm.
The height of the cuboid is 1 cm more than the length x cm.
The volume of the cuboid is 230 cm^3.

(a) Show that $x^3 + x^2 = 230$

(2)

The equation $x^3 + x^2 = 230$

has a solution between $x = 5$ and $x = 6$.

(b) Use a trial and improvement method to find this solution.
Give your answer correct to 1 decimal place.
You must show **all** your working.

$x =$ .....

(4)

Page Total

16.

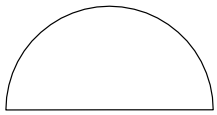

Diagram **NOT** accurately drawn

Leave blank

The diagram shows a semi-circle.
The diameter of the semi-circle is 15 cm.

Calculate the area of the semi-circle.
Give your answer correct to 3 significant figures.

.....

(3)

17. A straight line has equation $y = \frac{1}{2}x + 1$

The point P lies on the straight line.
P has a y-coordinate of 5.

(a) Find the x-coordinate of P.

.....

(2)

(b) Write down the equation of a different straight line that is parallel to $y = \frac{1}{2}x + 1$

.....

(1)

(c) Rearrange $y = \frac{1}{2}x + 1$ to make x the subject.

Leave blank

.....

(2)

18. Solve

$$2x - 3y = 11$$
$$5x + 2y = 18$$

$x =$ .....

$y =$ .....

(4)

Page Total

19.

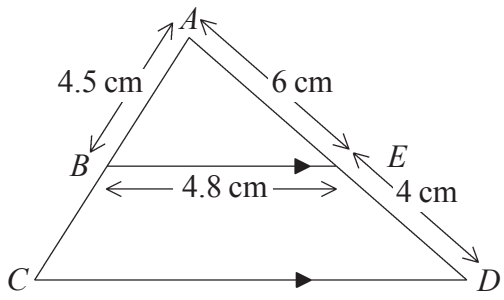

Diagram **NOT** accurately drawn

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BE is parallel to *CD*.
AE = 6 cm, *ED* = 4 cm, *AB* = 4.5 cm, *BE* = 4.8 cm.

(a) Calculate the length of *CD*.

.....cm
(2)

(b) Calculate the perimeter of the trapezium *EBCD*.

.....cm
(2)

Leave blank

20.

$$y^2 = \frac{ab}{a+b}$$

$a = 3 \times 10^8$
$b = 2 \times 10^7$

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

$y =$ .....

(3)

21.

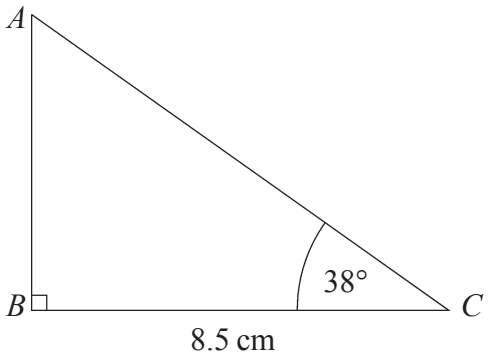


Diagram **NOT** accurately drawn

The diagram shows triangle ABC.
$BC = 8.5$ cm.
Angle $ABC = 90°$.
Angle $ACB = 38°$.

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

.....cm

(3)

Page Total

Leave blank

22. Julie does a statistical experiment. She throws a dice 600 times.
She scores six 200 times.

(a) Is the dice fair? Explain your answer.

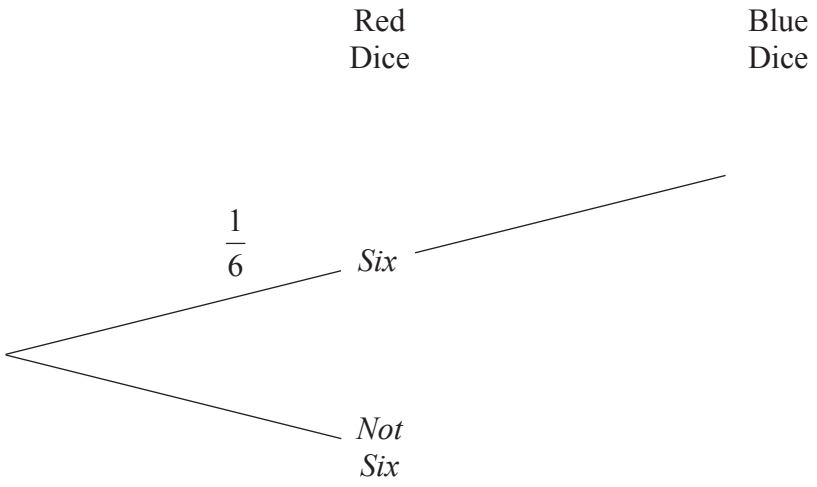
.....

.....

(1)

Julie then throws a fair red dice once and a fair blue dice once.

(b) Complete the probability tree diagram to show the outcomes.
Label clearly the branches of the probability tree diagram.
The probability tree diagram has been started in the space below.



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TOTAL FOR PAPER : 100 MARKS

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