PAST PAPER

Mathematics
Calculator Paper

Name.
Surname.
School/University
Contact number.

Time allowed 1hour 15 minutes

Instruction to candidates

- Write your name and all details in the space above.
- Answer all questions in the spaces provided.
- Additional sheets of paper may be used.

Information for candidates

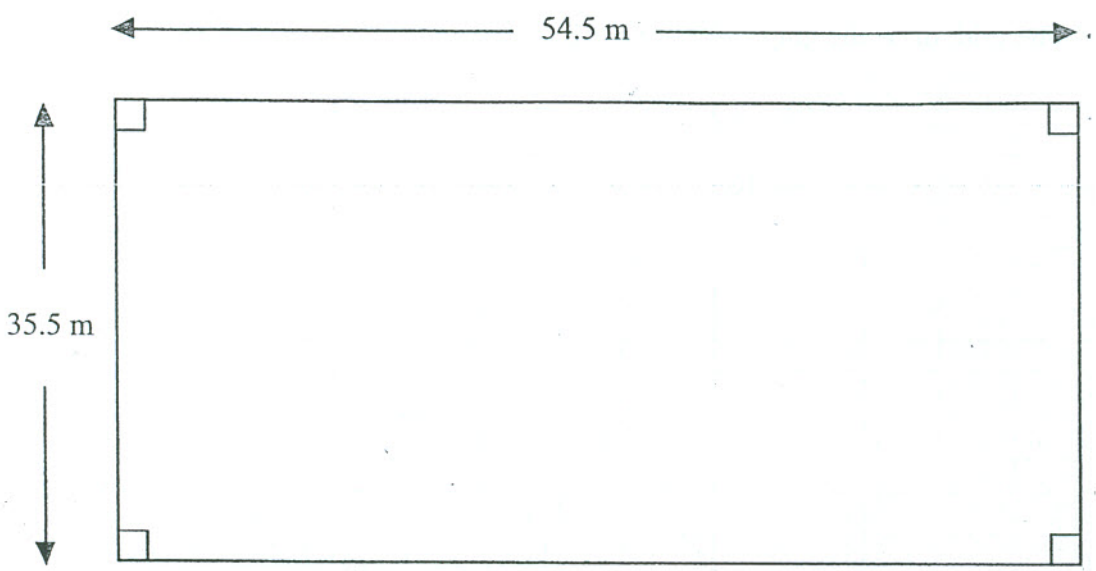
- The marks for individual questions and parts of questions are shown in brackets: e.g. (2)
- There are 17 questions in this paper.
- The total marks for this paper is 83.
- **Calculators may be used.**

Advice to candidates

- Show all stages in any calculation
- 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.

1 The diagram shows a rectangular field.

Diagram **NOT** accurately drawn



The length of the field is 54.5 m.
The width of the field is 35.5 m.

The field is for sale.
Mrs Fox wants to buy the field.
She also wants to plant a hedge along the perimeter.

The field costs £11.44 per square metre.
Each metre length of hedge costs £4.81

Mrs Fox has £23 000

Has Mrs Fox enough money to buy the field and plant the hedge?

You must show the working you use to make your decision.

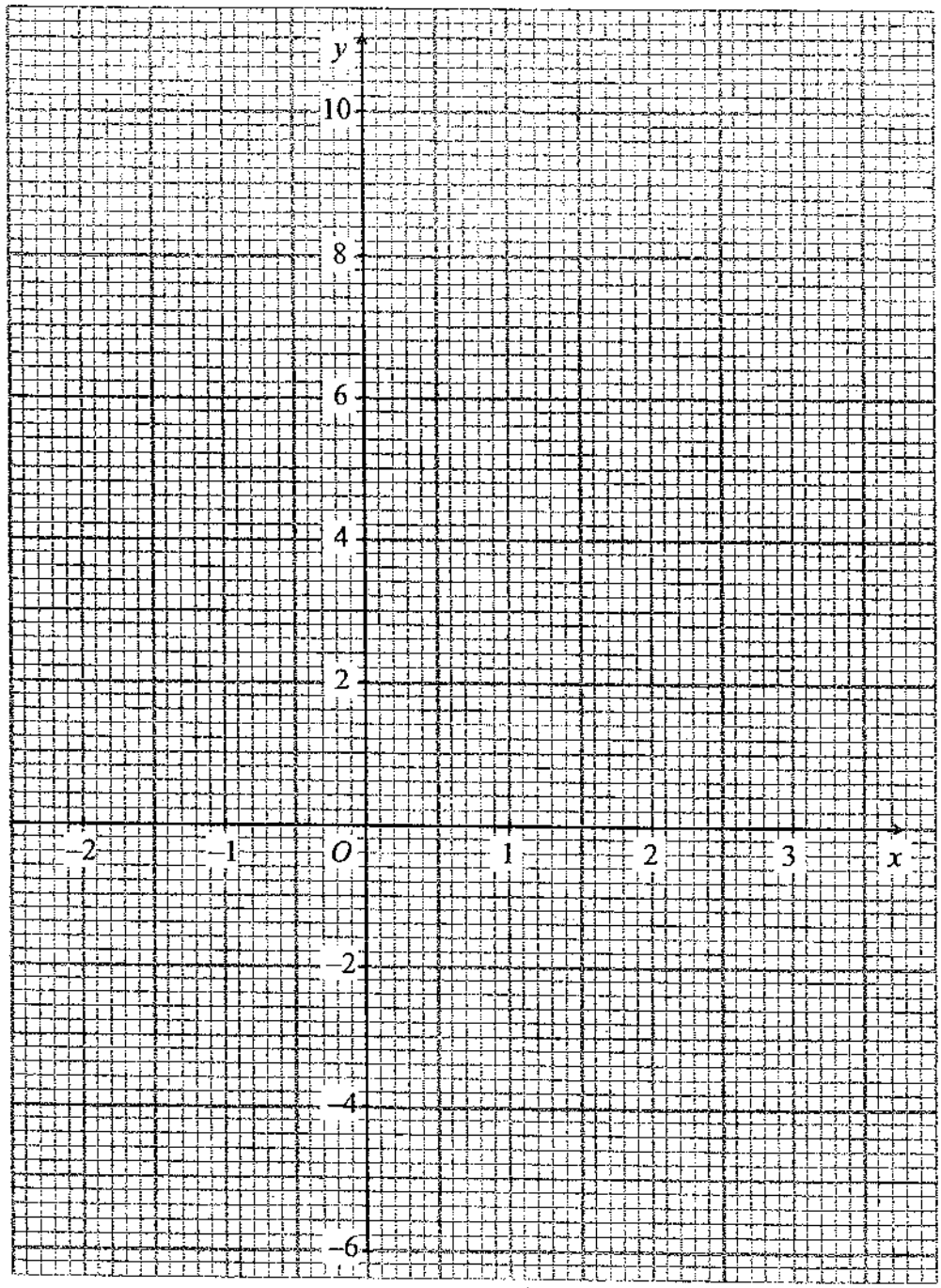
(Total 6 marks)

2 (a) Complete the table of values for $y = 3x + 1$

x	–2	–1	0	1	2	3
y	–5		1			

(2)

(b) On the grid, draw the graph of $y = 3x + 1$



(2)

(c) Use your graph to find

(i) the value of y when $x = -0.8$

$y =$ .....

(ii) the value of x when $y = 8.2$

$x =$ .....

(2)

(Total 6 marks)

3 Jenny worked in a bookshop for two weeks.

She is paid £125 per week **plus** 10% of the total value of the books she sells that week.

In the first week, she sold books with a total value of £800.

(a) Work out the total amount she was paid in the first week.

£ .....

(3)

In the second week, Jenny was paid a total of £225

(b) Work out the total value of the books she sold in the second week.

£ .....

(3)

(Total 6 marks)

4 (a) Solve $4x - 1 = 7$

$x =$ .....

(2)

(b) Solve $5(2y + 3) = 20$

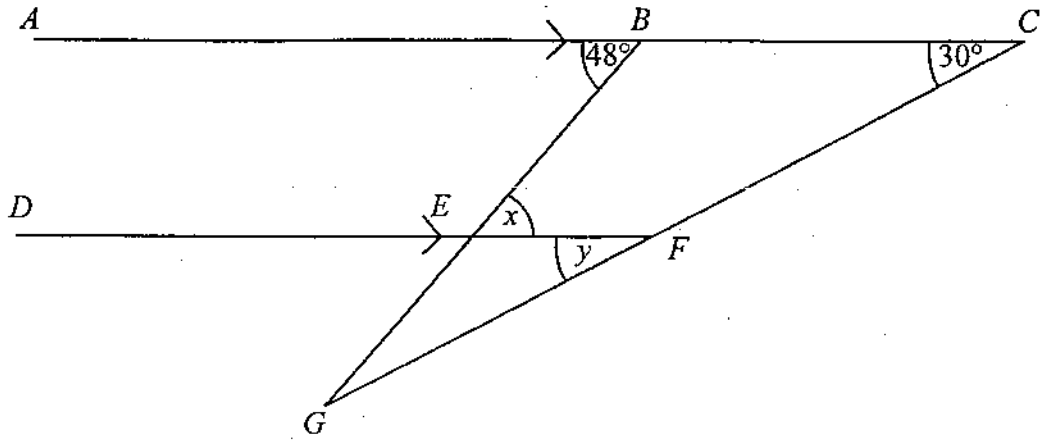
$y =$ .....

(3)

(Total 5 marks)

5

Diagram **NOT** accurately drawn



BEG and *CFG* are straight lines.
ABC is parallel to *DEF*.
Angle *ABE* = 48°.
Angle *BCF* = 30°.

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

$x =$ .....°

(ii) Give a reason for your answer.

.....

(2)

(b) (i) Write down the size of the angle marked y.

$y =$ .....°

(ii) Give a reason for your answer.

.....

(2)

(Total 4 marks)

6 56 students were asked if they watched tennis yesterday.
20 of the students are boys.
17 girls watched tennis.
13 boys did not watch tennis.

(a) Use this information to complete the two way table.

	Boys	Girls	Total
Watched tennis			
Did not watch tennis			
Total			

(3)

One of these students is to be chosen at random.

(b) Write down the probability that the student chosen is a boy.

.....

(2)

(Total 5 marks)

7 The diagram shows a trapezium of height 3 m.

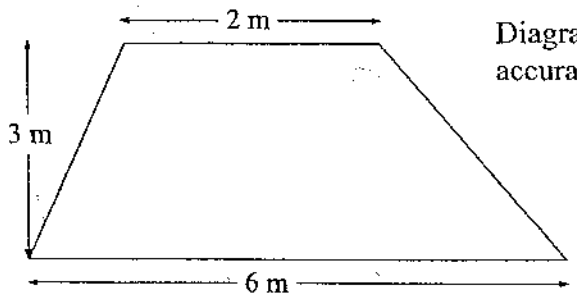


Diagram **NOT** accurately drawn

Find the area of this trapezium.

State the units with your answer.

.....

(Total 3 marks)

8 Fred did a survey on the areas of pictures in a newspaper.
The table gives information about the areas.

Area (A cm^2)	Frequency
$0 < A \leqslant 10$	38
$10 < A \leqslant 25$	36
$25 < A \leqslant 40$	30
$40 < A \leqslant 60$	46

Work out an estimate for the mean area of a picture.

.....cm^2

(Total 4 marks)

9 A doctor has 12 000 patients.

4560 of these patients are male.

(a) What percentage of these patients are **female**?

..... %

(3)

10 Sangita is on holiday in Switzerland.
She buys a train ticket.

She can pay either 100 Swiss Francs or 70 Euros.

£1 = 2.10 Swiss Francs
£1 = 1.40 Euros

She pays in Swiss Francs rather than Euros.
Work out how much she saves.
Give your answer in pounds.

£ .....

(Total 4 marks)

11 (a) Use your calculator to work out the value of $\frac{8.95+\sqrt{7.84}}{2.03\times1.49}$

Write down all the figures on your calculator display.

.....

(2)

(b) Write down your answer to part (a) correct to 3 significant figures.

.....

(1)

(Total 3 marks)

12 Ann, Bill and Colin are travelling in a car from Glasgow to Poole.
Ann, Bill and Colin share the driving so that the distances they drive are in the ratio 3:4:4
Ann drives a distance of 210 km.

(a) Calculate the total distance they travelled from Glasgow to Poole.

..... km
(3)

Ann drives the 210 km in 2 hours 40 minutes.

(b) Work out Ann's average speed.

..... km/h
(3)

Colin's case weighs 7 kg correct to the nearest kg.

(c) (i) Write down the greatest possible weight of Colin's case.

..... kg

(ii) Write down the least possible weight of Colin's case.

..... kg
(2)

(Total 8 marks)

13

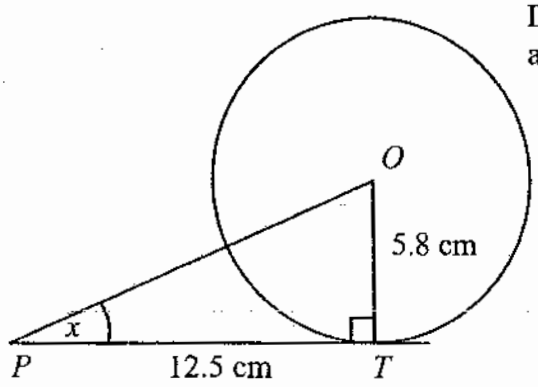


Diagram **NOT** accurately drawn

In the diagram, T is a point on a circle, centre O.
PT is the tangent to the circle at T.

(a) Angle OTP is a right angle.
Give a reason why.

.....

(1)

The radius of the circle is 5.8 cm.
$PT = 12.5$ cm.

(b) Calculate the size of angle x.
Give your answer correct to 1 decimal place.

$x =$ .....°

(3)

C is the point on the circle where the straight line OP crosses the circle.

(c) Calculate the length of PC.
Give your answer correct to 3 significant figures.

..... cm

(4)

(Total 8 marks)

14

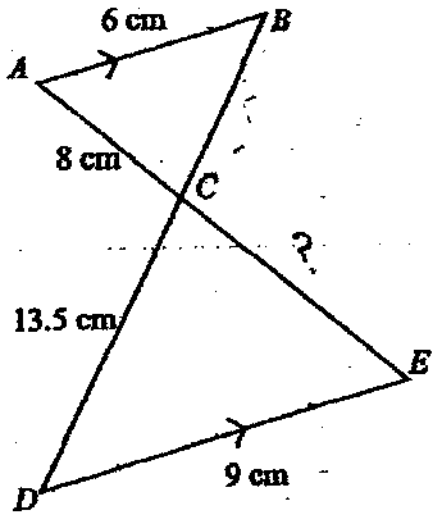


Diagram NOT accurately drawn

AB is parallel to *DE*.
ACE and *BCD* are straight lines.
AB = 6 cm,
AC = 8 cm,
CD = 13.5 cm,
DE = 9 cm.

(i) Work out the length of *CE*.

..... cm

(ii) Work out the length of *BC*.

..... cm

(Total 3 marks)

15 Bytes is a shop that sells computers and digital cameras.

In 2003, Bytes sold 620 computers.
In 2004, Bytes sold 708 computers.

(a) Work out the percentage increase in the number of computers sold.
Give your answer to an appropriate degree of accuracy.

..... %
(4)

In a sale, normal prices are reduced by 14 %.

The sale price of a digital camera is £129.86

(b) Work out the normal price of the digital camera.

£ .....
(3)

The table shows the number of digital cameras Bytes sold each month in the first six months of 2005.

Month	January	February	March	April	May	June
Number of digital cameras sold	30	19	20	15	27	39

The first 3-month moving average for this data is 23

(c) Work out the second 3-month moving average for this data.

.....
(2)

(Total 9 marks)

16 Solve the simultaneous equations

$$3x + 7y = 26$$
$$4x + 5y = 13$$

$x =$ .....

$y =$ .....

(Total 4 marks)

17 Lisa said that -2 is the **only** value of x that satisfies the equation $x^2 + 4x + 4 = 0$

Was Lisa correct?
Show working to justify your answer.

(Total 2 marks)

ET Equivalency Testing

for career development

Mathematics
Non-Calculator Paper

NAME……

SURNAME……

DATE……

SCHOOL/UNIVERSITY……

CONTACT NUMBER……

Question Number	Mark
1	
2	
3	
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9	
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12	
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14	
15	
16	
17	
18	
19	
20	
21	
TOTAL	

Time Allowed 1 Hour 15 minutes

1 In addition to this paper you may need
2 A ruler
3 A protractor
4 A pair of compasses

Instruction to candidates

1 Write your name and other details in the spaces provided above
2 Answer all questions in the spaces provided
3 Additional sheets may be used
4 Calculators **MAY NOT BE USED** in this paper

Information for candidates

1 The marks available are given at the end of each question and part question e.g. (2)
2 There are 20 questions in this paper

Advice to candidates

1 Work steadily through the paper
2 Don't spend to long on one question
3 If you can not answer a question leave it and attempt the next one
4 Return at the end to those you have left out
5 If you have time at the end, go back and check your answers

Examiners Initials

Percentage

Equivalency Testing Office 72 Walton Gardens, Hutton, Essex, CM13 1EP
Telephone 01277 203336 Mobile 07725898768
e: info@equivalencytesting.com www.equivalencytesting.com

1 The table gives information about the number of goals scored by a football team in each match during a season.

Number of goals	Number of matches
0	9
1	8
2	12
3	5

Work out the total number of goals scored by the football team during the season.

.....

(Total 2 marks)

2 Pat writes down two sums.

$$1 + 2 = 3$$

$$7 + 8 = 15$$

Pat says

'The sum of two whole consecutive numbers is never a square number'.

Give an example to show that Pat is **wrong**.

.....

(Total 2 marks)

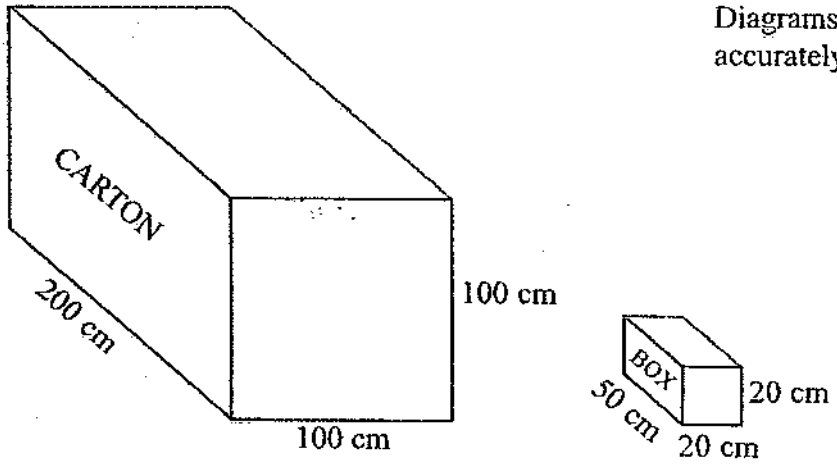
3 A cuboid has

a volume of 40 cm^3
a length of 5 cm
a width of 2 cm

(a) Work out the height of the cuboid.

.....cm
(2)

(b)



Diagrams **NOT** accurately drawn

A carton measures 200cm by 100cm by 100cm.

The carton is to be completely filled with boxes.

Each box measures 50cm by 20cm by 20cm.

Work out the number of boxes which can completely fill the carton.

.....
(3)

(Total 5 marks)

4 The diagram shows a 6-sided shape made from a rectangle and a right-angled triangle.

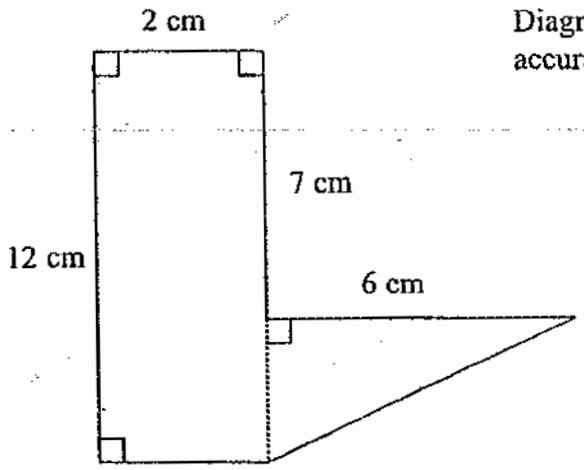


Diagram **NOT** accurately drawn

Work out the total area of the 6-sided shape.

.....cm^2

(Total 3 marks)

5 Change 50 000 mm^2 to cm^2.

.....cm^2

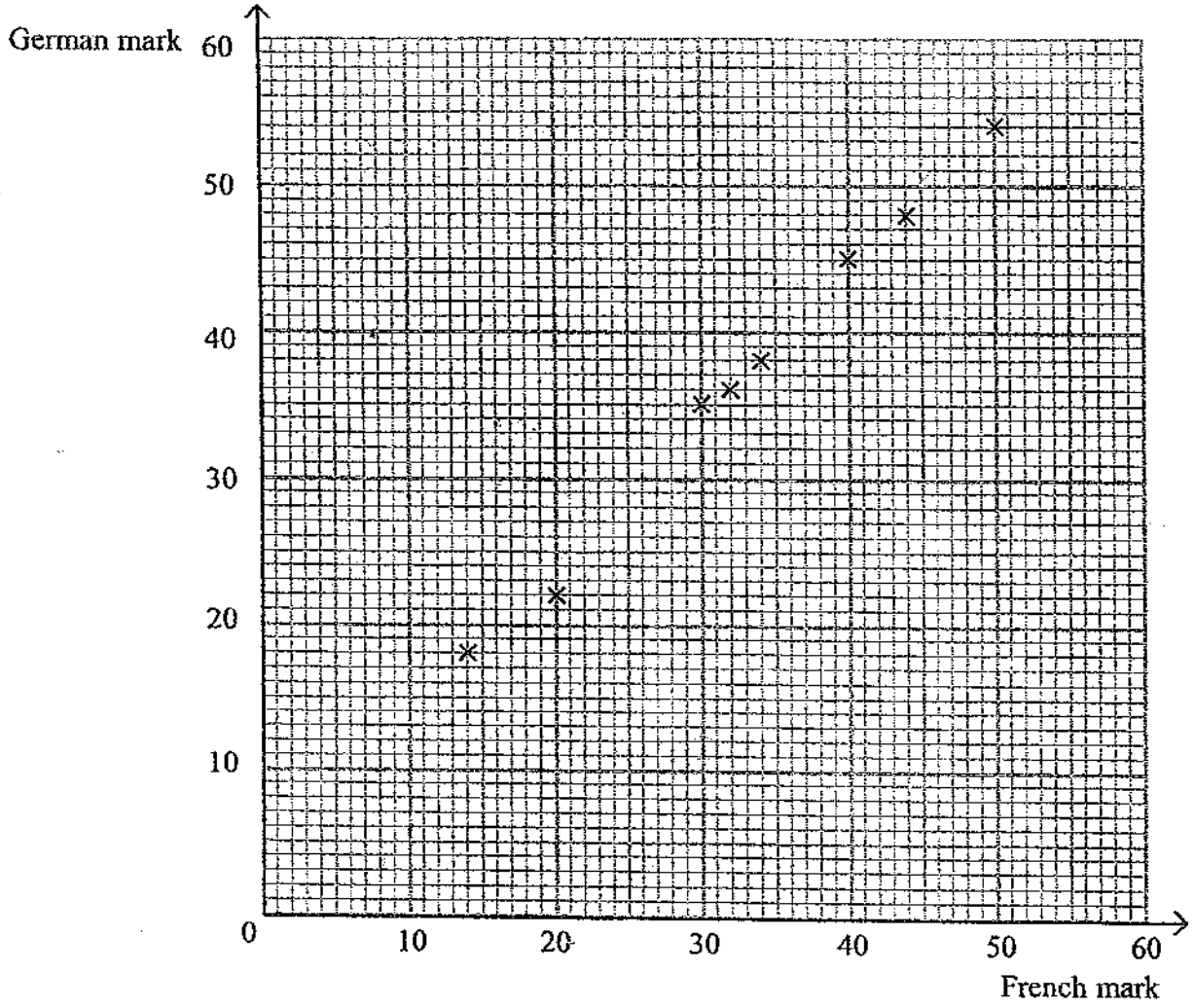
(Total 2 marks)

6 10 students each took a French test and a German test.
The table shows their marks.

French marks	44	30	40	50	14	20	32	34	20	45
German marks	48	35	45	54	18	22	36	38	25	50

(a) Complete the scatter graph to show the information in the table.
The first 8 points in the table have been plotted for you.

(1)



(b) What type of correlation does this scatter graph show?

.....

(1)

(c) Draw a line of best fit on the scatter diagram.

(1)

(d) Use your line of best fit to estimate

(i) the German mark for a student with a French mark of 26,

.....

(ii) the French mark for a student with a German mark of 43.

.....

(2)

(Total 5 marks)

---

7 The cost of a compact disc holder is 25p.
John has £15 to spend.

(a) What is the greatest number of compact disc holders that John can buy for £15?

.....

(3)

A compact disc player costs £50 plus 17½% VAT.

(b) Calculate the total cost of the compact disc player.

£.....

(3)

(Total 6 marks)

8 (a) Simplify $4a + 5b - 3b + a$

.....

(2)

(b) Simplify $x^3 + x^3$

.....

(1)

(c) Factorise $x^2 - 3x$

.....

(2)

(Total 5 marks)

---

9 Emma repairs bicycles.
She keeps records of the cost of the repairs.

The table gives information about the costs of all repairs which she carried out in one week.

Cost (£C)	Frequency
$0 < C \leqslant 10$	3
$10 < C \leqslant 20$	7
$20 < C \leqslant 30$	6
$30 < C \leqslant 40$	8
$40 < C \leqslant 50$	9

Find the class interval in which the median lies.

.....

(Total 2 marks)

10 Some students each chose one PE activity.

$\frac{1}{5}$ of the students chose swimming.

$\frac{3}{8}$ of the students chose tennis.

All the rest of these students chose cricket.

What fraction of the students chose cricket?

.....

(Total 3 marks)

11

Cinema Ticket Prices	
Adults	£4
Child	£3

An adult ticket costs £4.
A child ticket costs £3.

(a) Write down a formula for the total cost, £T, for n adult tickets and c child tickets.

.....

(3)

Hina spends £47 on cinema tickets.
She buys 8 adult tickets.

(b) Work out how many child tickets she buys.

.....

(3)

(Total 6 marks)

12

Canal boat for hire
£1785.00
for 14 days

(a) What is the cost **per day** of hiring the canal boat?

£.....
(3)

Jenny and Kath hire the canal boat for 14 days.
They share the hire cost of £1785.00 in the ratio 2:3

(b) Work out the smaller share.

£.....
(2)

(Total 5 marks)

13 Work out an estimate for the value of

$$\frac{5.79 \times 312}{0.523}$$

.....
(Total 3 marks)

14 A school snack bar offers a choice of four snacks.
The four snacks are burgers, pizza, pasta and salad.
Students can choose **one** of these four snacks.

The table shows the probability that a student will choose burger or pizza or salad.

Snack	burger	pizza	pasta	salad
Probability	0.35	0.15		0.2

One student is chosen at random from the students who use the snack bar.

(a) Work out the probability that the student

(i) did **not** choose salad,

.....

(ii) chose pasta.

.....

(3)

300 students used the snack bar on Tuesday.

(b) Work out an estimate for the number of students who chose pizza.

.....

(2)

(Total 5 marks)

15 Here are some expressions.

$\frac{\pi r^3}{x}$	$\frac{r^3}{\pi}$	$\pi x+r$	πr^2+rx	$\pi(x+r)$	$\frac{\pi^3}{x^2}$

The letters r and x represent lengths. π is a number that has no dimensions.

Tick (✔) the boxes underneath the two expressions that can represent areas.

(Total 2 marks)

16

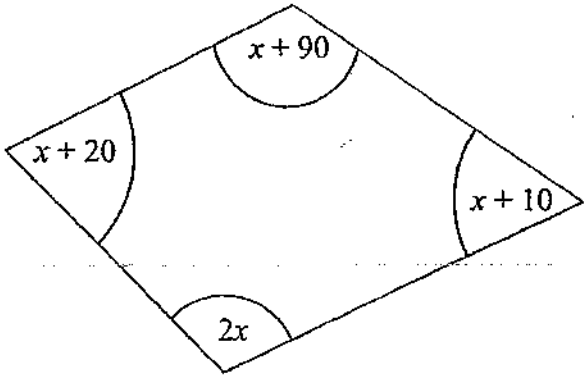


Diagram **NOT** accurately drawn

The sizes of the angles, in degrees, of the quadrilateral are

$x + 10$
$2x$
$x + 90$
$x + 20$

(a) Use this information to write down an equation in terms of x.

.....

(2)

(b) Use your answer to part (a) to work out the size of the smallest angle of the quadrilateral.

.....°

(3)

(Total 5 marks)

17 (a) Write the number 40 000 000 in standard form.

.....

(1)

(b) Write 1.4×10^{-5} as an ordinary number.

.....

(1)

(c) Work out

$$(5 \times 10^{4}) \times (6 \times 10^{9})$$

Give your answer in standard form.

.....

(2)

(Total 4 marks)

18

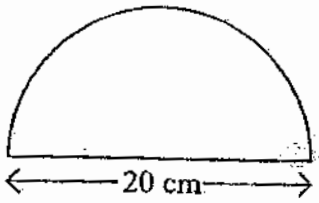


Diagram **NOT** accurately drawn

A semicircle has a diameter of 20 cm.

Work out the perimeter of the semicircle.
Take the value of π to be 3.14

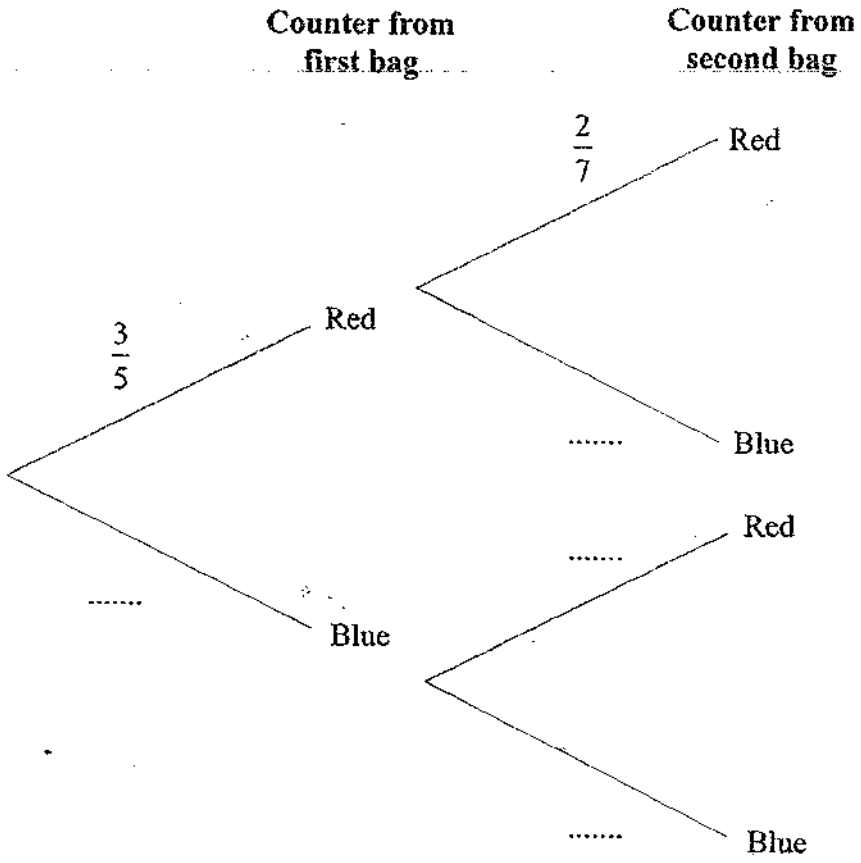
.....cm

(Total 3 marks)

19 Loren has two bags.
The first bag contains 3 red counters and 2 blue counters.
The second bag contains 2 red counters and 5 blue counters.

Loren takes one counter at random from each bag.

Complete the probability tree diagram.



(Total 2 marks)

20 (a) Expand and simplify

$(x - y)^2$

.....

(2)

(b) Rearrange $a(q - c) = d$ to make q the subject.

q =.....

(3)

(Total 5 marks)

END

Answer sheet to PP2

Calculator paper		Non Calculator paper	
Q1	£11.44 x 54.5 x 35.5 = £22133.54 (4.81 x 109)+(4.81 x 71) = £865.8 Total cost = £22999.34 Yes.	Q1	Total number of goals = 47
Q2	X -2 -1 0 1 2 3 Y -5 -2 1 4 7 10 X = -0.8 y = -1.4, y = 8.2 x = 2.8	Q2	4 + 5 = 9 9 is a square number.
Q3(a) (b)	£205 1000 books	Q3(a) (b)	Height = 4 Answer = 100 boxes.
Q4(a) (b)	X = 2 Y = 0.5	Q4	Total area = 39
Q5(a) (b)	X = 48, alternate angles. Y = 30, corresponding angles.	Q5	$50000mm^2 = 500cm^2$
Q6(a) (b)	7 17 24 13 19 32 20 36 56 20/56 or 5/14	Q6(a) (b) (c) (d)	Plot remainder of points. Positive correlation. Draw straight line of best fit. French mark = 26 German mark = 30 German mark of 43 French mark = 40
Q7	Area = 12	Q7(a) (b)	60 compact disc holders. £58.75
Q8	4095/150 = 27.3 is the mean	Q8(a) (b) (c)	5a + 2b $2x^3$ x(x – 3)
Q9	7440 females = 62%	Q9	30 < C ≤ 40 Median value is 17
Q10	100 Swiss francs = £47.62 70 Euros = £50.00 Answer £2.38 saving.	Q10	1choose cricket 7/40
Q11(a) (b)	3.884682778 3.88	Q11(a) (b)	£T = 4n + 3c 5 child tickets.
Q12(a) (b) (c)	770km Ann's average speed 78.75 7.4kg 6.5kg	Q12(a) (b)	£127.5 per day. £714 for the smaller share.
Q13(a) (b) (c)	PT is a tangent X = 24.9 OP = 13.7 so PC = 7.98	Q13	Answer 3600 (6 x 300) / .5
Q14(a) (b)	CE = 12 BC = 9	Q14(a) (b)	0.8 did not choose salad 0.3 chose pasta 45chose pizza
Q15(a) (b) (c)	14% £151 20.67	Q15	$\pi r^3/x$ and $\pi r^2 + rx$
Q16	Y = 5 X = -3	Q16(a) (b)	5x + 120 = 360 x = 48. Smallest angle = 58 (x + 10)
Q17	(x + 2)(x + 2) = 0 so x = -2	Q17(a) (b) (c)	4.0×10^7 0.000014 3×10^{14}

		Q18	51.4cm
		Q19	2/7 5/7 3/5 2/5 2/7 5/7
		Q20(a) (b)	$x^2 + y^2$ q = (d/a) + c