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General Certificate of Secondary Education  
2014

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Candidate Number

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## Mathematics

Unit T2

(With calculator)



Foundation Tier

[GMT21]

ML

TUESDAY 27 MAY, 9.15am–10.45am

### TIME

1 hour 30 minutes, plus your additional time allowance.

### INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

**You must answer the questions in the spaces provided. Do not write outside the box, around each page, on blank pages or tracing paper.**

Complete in blue or black ink only.

Answer **all twenty-seven** questions.

Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

You **may** use a calculator for this paper.

### INFORMATION FOR CANDIDATES

The total mark for this paper is 100.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Functional Elements will be assessed in this paper.

Quality of written communication will be assessed in **questions 3 and 26**.

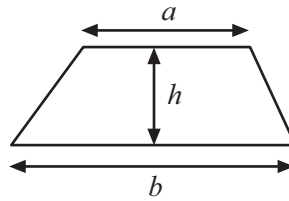
You should have a calculator, ruler, compasses and a protractor.

The Formula Sheet is on page 2.

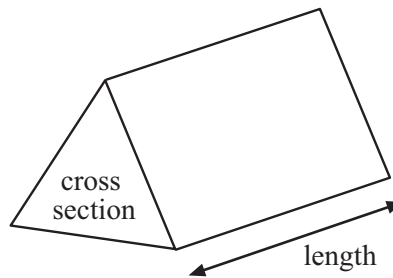
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# Formula Sheet

$$\text{Area of trapezium} = \frac{1}{2} (a + b)h$$



$$\text{Volume of prism} = \text{area of cross section} \times \text{length}$$



1 Calculate

(a)  $\sqrt{7.84} - 1.3^2$

Answer \_\_\_\_\_ [2]

(b)  $\frac{1}{0.4^3}$

Answer \_\_\_\_\_ [1]

Examiner Only	
Marks	Remark
Total Question 1	

2 There were 304 000 flights from 10 UK airports. 74% of these flights were on time.

How many flights were on time?

Answer \_\_\_\_\_ [2]

Total Question 2	

**Quality of written communication will be assessed in this question.**

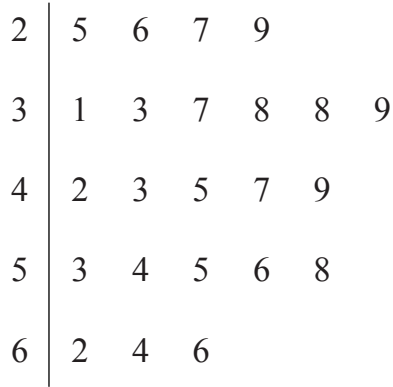
3 Tina bought a garden ornament costing £12.75 She also bought some shrubs. Each shrub cost £3.15  
The total cost was £31.65  
How many shrubs did she buy?

Answer \_\_\_\_\_ [3]

Total Question 3	

**[Turn over**

4 The stem and leaf diagram shows the weights of some schoolbags.



Key 2 | 5 = 2.5 kg

Write down

(a) the range,

Answer \_\_\_\_\_ kg [1]

(b) the median.

Answer \_\_\_\_\_ kg [1]

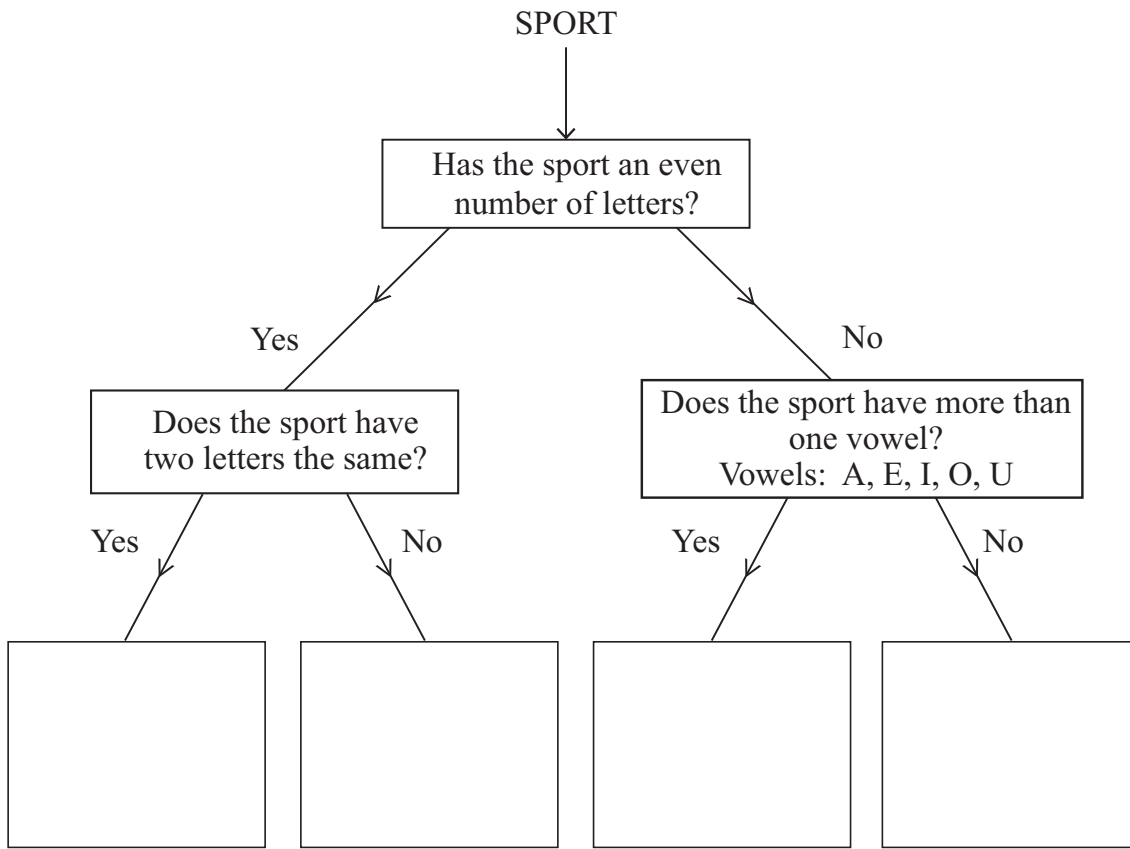
Examiner Only

Marks	Remark
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Total Question 4	

5 (a) Use the decision tree diagram to write the sports below in the correct boxes.

CYCLING      GYMNASTICS      ROWING      TENNIS



[2]

Examiner Only

Marks	Remark



6 (a) The diagram shows a triangle.

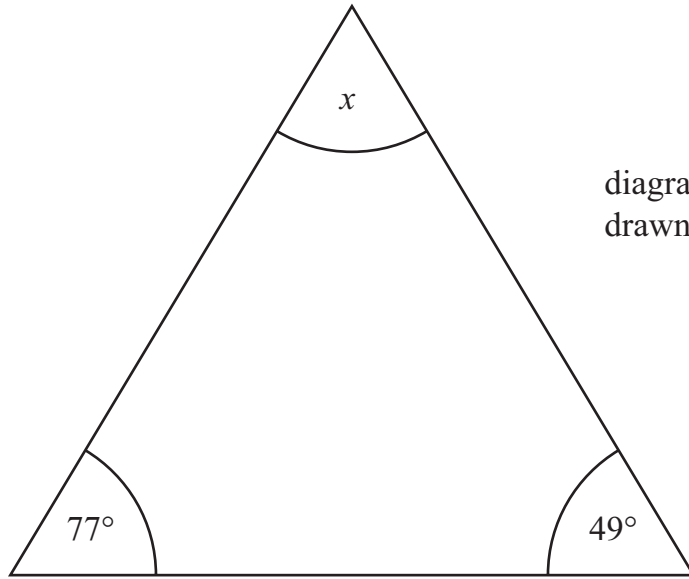


diagram not  
drawn accurately

Work out the size of the angle marked  $x$

Answer  $x =$  \_\_\_\_\_  $^\circ$  [2]

(b) A sheet of A4 paper is a rectangle 297 mm long and 210 mm wide.

Calculate the area of a sheet of A4 paper.

Give your answer in square centimetres.

Answer \_\_\_\_\_  $\text{cm}^2$  [2]

Examiner Only

Marks

Remark

(c) ABCD is a quadrilateral.

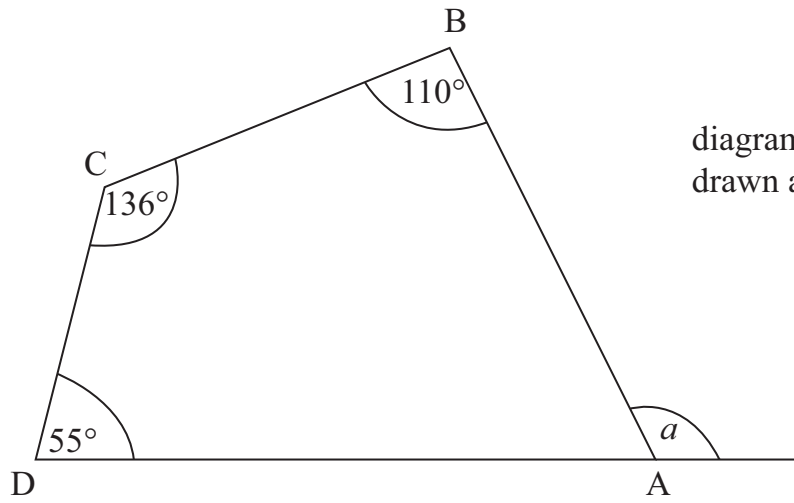


diagram not  
drawn accurately

Work out the size of the exterior angle,  $a$ .

Answer  $a =$  \_\_\_\_\_  $^{\circ}$  [3]

(d) PQR is an isosceles triangle.

$PQ = QR$

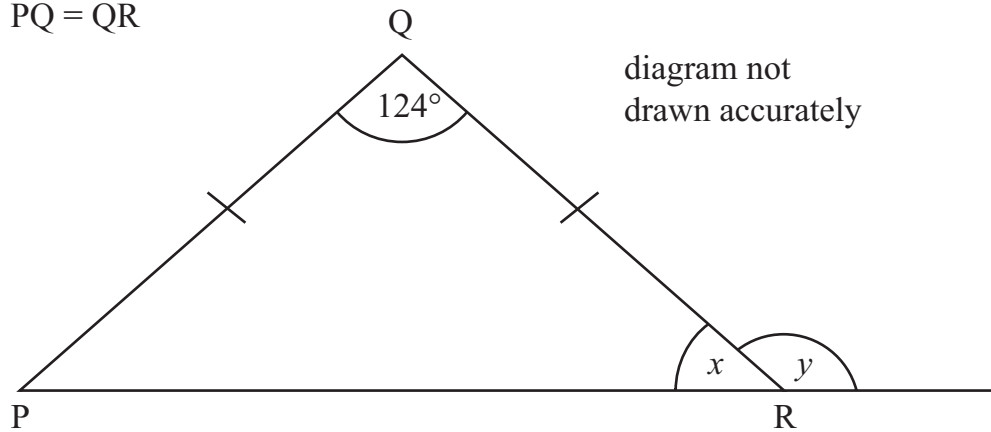


diagram not  
drawn accurately

Calculate the angles  $x$  and  $y$ .

Answer  $x =$  \_\_\_\_\_  $^{\circ}$   
 $y =$  \_\_\_\_\_  $^{\circ}$  [3]

Examiner Only	
Marks	Remark
Total Question 6	



7 Solve

(a)  $\frac{y}{4} = 12$

Answer  $y =$  \_\_\_\_\_ [1]

(b)  $2d - 4 = 5$

Answer  $d =$  \_\_\_\_\_ [2]

Examiner Only

Marks Remark

Total Question 7

8 (a) Simplify  $6b - 2k + 3b - k$

Answer \_\_\_\_\_ [2]

(b) Find the value of  $3x + 5y$  when  $x = -2$  and  $y = 3$

Answer \_\_\_\_\_ [2]

Total Question 8

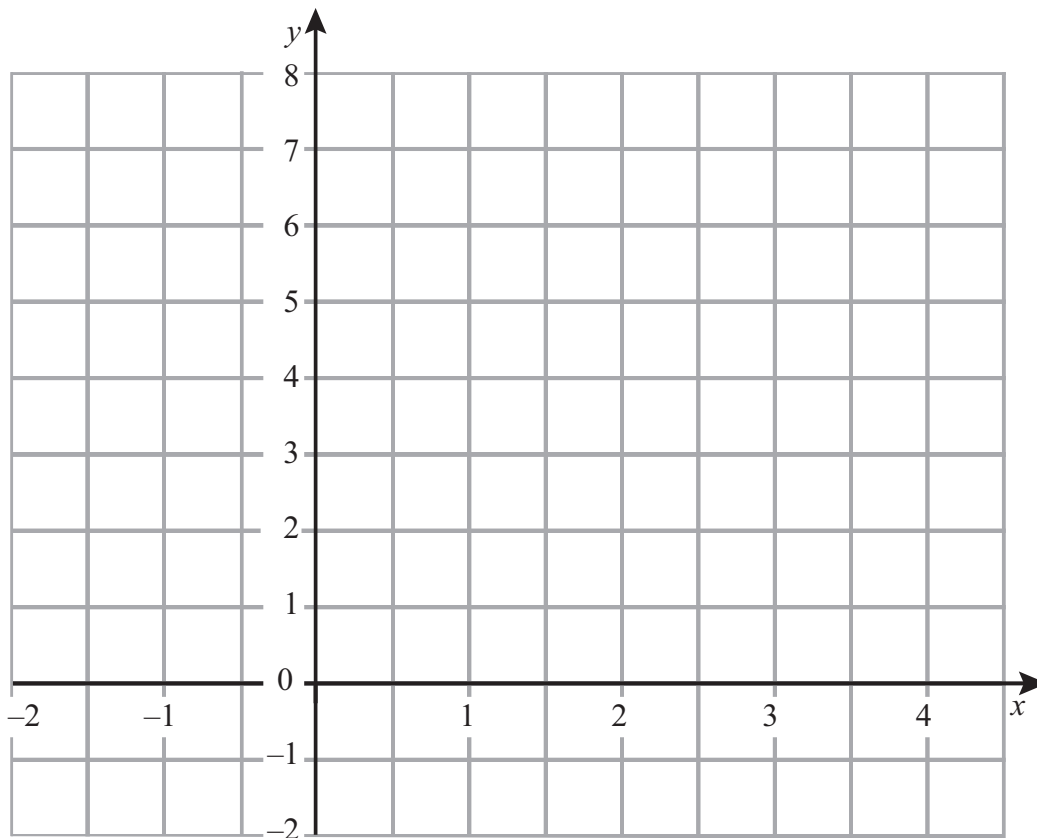
9 (a) Complete the table of values for  $y = 5 - 2x$

$x$	-1	0	1	2	3
$y$	7				

[2]

(b) On the axes below, draw the graph of  $y = 5 - 2x$

[1]



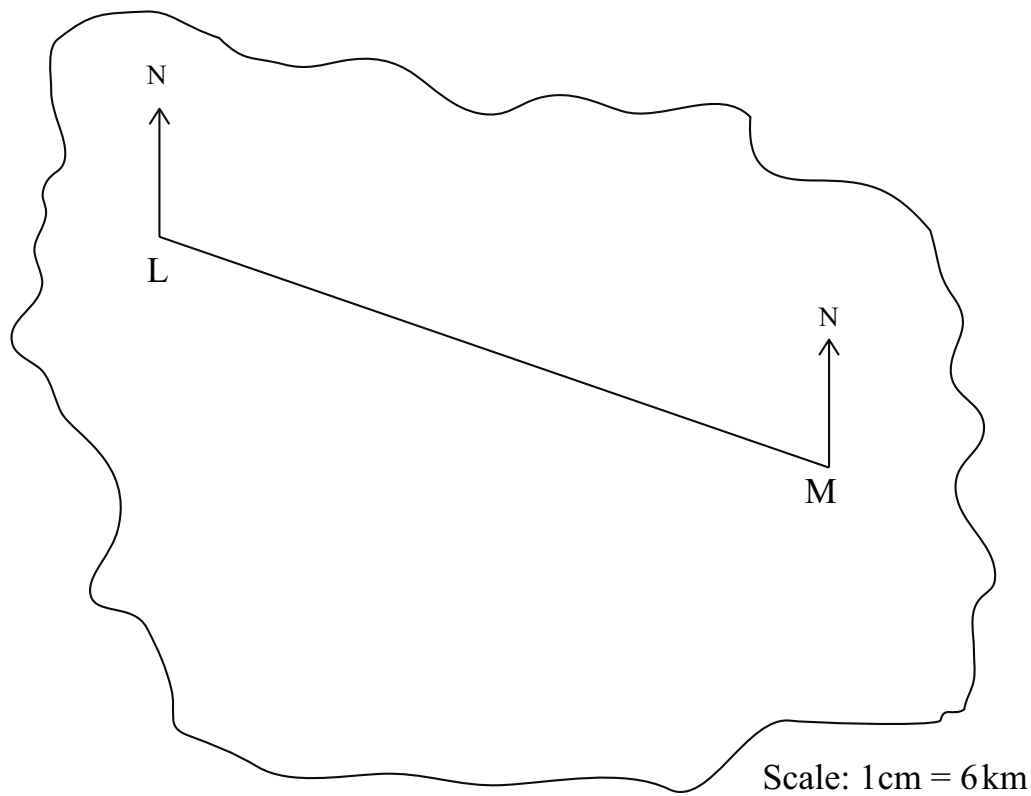
Examiner Only

Marks Remark

Total Question 9

10 A map of an island is shown below.

L and M are the positions of two houses on the island.



(a) What is the bearing of L from M?

Answer \_\_\_\_\_° [1]

(b) Calculate the actual distance from L to M in kilometres.

Answer \_\_\_\_\_ km [2]

(c) A third house, H, is on a bearing of  $130^\circ$  from L and on a bearing of  $225^\circ$  from M.

Mark the position of H on the diagram above.

[3]

Examiner Only

Marks Remark

Total Question 10

[Turn over

11 The petrol tank of a lawnmower holds  $\frac{2}{3}$  of a litre.

How many times can this lawnmower be completely filled from a 5 litre can?

Answer \_\_\_\_\_ [2]

Examiner Only	
Marks	Remark
Total Question 11	

12 There are 150 Year 8 pupils in St. Kilda's Secondary School.

$\frac{3}{5}$  of these pupils come to school by bus.

24% of these pupils walk to school. The remainder come by car.

How many Year 8 pupils come to school by car?

Answer \_\_\_\_\_ [3]

Total Question 12	

13 Bill has two options on how to pay for a car.

Option 1. Cash Price £9695

Option 2. A deposit of £1899 + 35 monthly payments of £146 + a final payment of £3785

Calculate which option is cheaper and by how much.

Answer Option \_\_\_\_\_ is cheaper by £ \_\_\_\_\_ [3]

Examiner Only

Marks Remark

Total Question 13

14 The match attendance for Bidford United last week was 2350

This week the match attendance fell by 640

To the nearest whole number, what was the percentage fall on the match attendance?

Answer \_\_\_\_\_ % [2]

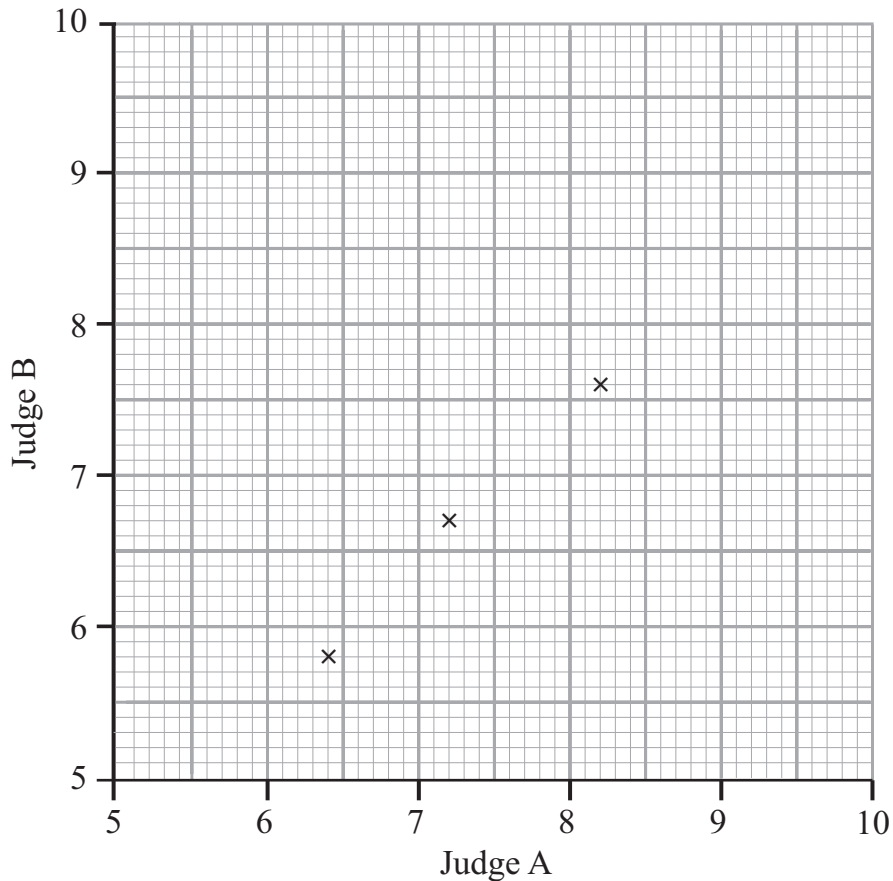
Total Question 14

[Turn over

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- 15 The table shows the marks awarded by two judges to seven competitors in a dancing competition.

Judge A	8.2	6.4	7.2	6.8	5.6	8.2	9.0
Judge B	7.6	5.8	6.7	6.8	5.2	8.6	9.2



- (a) The first three points have already been plotted.  
Use the data to complete the scatter graph. [2]
- (b) Draw the line of best fit. [1]
- (c) Another competitor was awarded 7.7 marks by Judge A.  
Estimate the marks awarded to this competitor by Judge B.

Answer \_\_\_\_\_ [1]

- (d) What type of correlation does your graph show?

Answer \_\_\_\_\_ [1]

Examiner Only	
Marks	Remark
Total Question 15	

- 16 Look at the table below.  
It shows the increase in height of 100 children over a period of time.

Increase in height ( $h$ cm)	$0 < h \leq 2$	$2 < h \leq 4$	$4 < h \leq 6$	$6 < h \leq 8$	$8 < h \leq 10$
Frequency	12	34	42	10	2

- (a) Show this information on a bar chart.



[3]

- (b) Write down the modal class interval.

Answer \_\_\_\_\_ [1]

- (c) Describe how you would construct a frequency polygon for the data.

\_\_\_\_\_  
\_\_\_\_\_ [2]

Examiner Only

Marks

Remark

Total Question 16

[Turn over

17 Donna wants to investigate the hypothesis

**‘Children play more computer games than adults.’**

She surveys 10 girls in her class. She also surveys their parents.

Give two reasons why her sample is unsuitable.

Reason 1 \_\_\_\_\_

\_\_\_\_\_ [1]

Reason 2 \_\_\_\_\_

\_\_\_\_\_ [1]

Examiner Only	
Marks	Remark
Total Question 17	

18 A window cleaning firm cleans the windows of an office block.

The firm charges £50 plus £4 for each window they clean.

They clean  $w$  windows and charge £230

(a) Write an **equation** in terms of  $w$  using this information.

Answer \_\_\_\_\_ [2]

(b) Solve this equation to find the number of windows cleaned.

Answer \_\_\_\_\_ windows [2]

Total Question 18	



19 (a) Solve  $3p + 1 = 13 - p$

Answer  $p =$  \_\_\_\_\_ [3]

(b) Write down the  $n$ th term for the sequence

3, 8, 13, 18, .....

Answer \_\_\_\_\_ [2]

(c) Expand and simplify  $m(2 + m) + 3(2 - m)$

Answer \_\_\_\_\_ [2]

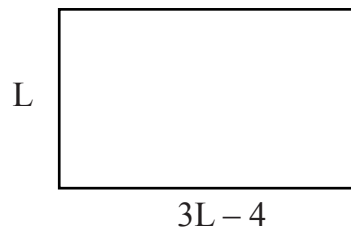
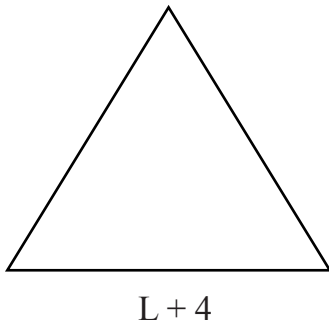
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Marks Remark

Total Question 19

[Turn over

- 20 An equilateral triangle has sides of length  $(L + 4)$  and a rectangle has sides of length  $L$  and  $(3L - 4)$  as shown.



diagrams not drawn accurately

The **perimeter** of the triangle and the **perimeter** of the rectangle are equal.

Set up and solve an equation to find the value of  $L$ .

**A solution by trial and improvement will not be accepted.**

Answer  $L =$  \_\_\_\_\_ [3]

Total Question 20

- 21 Express 378 as a product of prime factors.

Answer \_\_\_\_\_ [2]

Total Question 21



22 Half of the chimpanzees in a zoo weigh less than 45 kg.

$\frac{4}{5}$  of the chimpanzees weigh less than 55 kg.

No chimpanzees weigh exactly 45 kg.

What fraction of the chimpanzees weigh between 45 kg and 55 kg?

Answer \_\_\_\_\_ [3]

Examiner Only	
Marks	Remark
Total Question 22	
Total Question 23	

23 Sammy borrows £400 for nine months.

He is charged 12.5% per annum simple interest.

How much does he have to pay back?

Answer £ \_\_\_\_\_ [3]

24 The interior angle of a regular polygon is  $144^\circ$

Work out the number of sides of the polygon.

Show your working out.

Answer \_\_\_\_\_ sides [3]

Examiner Only	
Marks	Remark
Total Question 24	

25

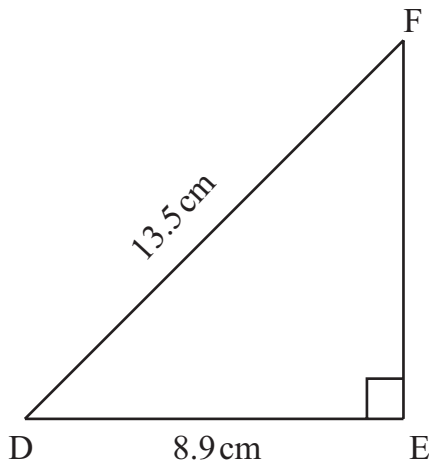


diagram not  
drawn accurately

DEF is a right-angled triangle.

DF = 13.5 cm and DE = 8.9 cm.

Calculate the length of EF.

Answer EF = \_\_\_\_\_ cm [3]

Total Question 24	
Total Question 25	

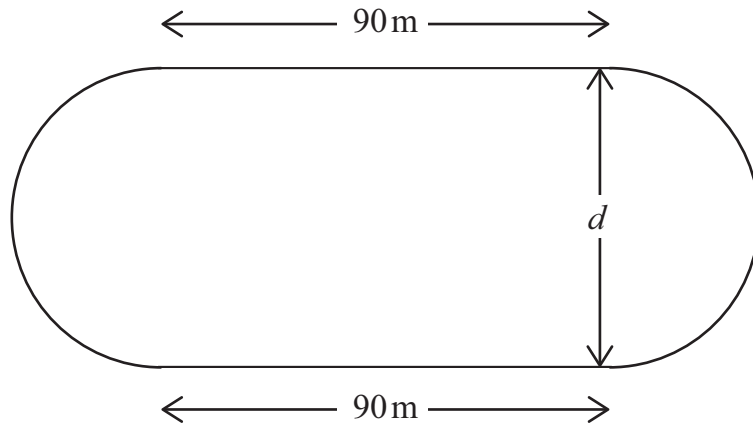
Quality of written communication will be assessed in this question.

26 The diagram below represents a running track.

It consists of two parallel straight lines and two semicircles.

The straight lines are each 90 metres in length.

The running track has a total perimeter of 400 metres.



Calculate the distance,  $d$ , between the two straight lines.

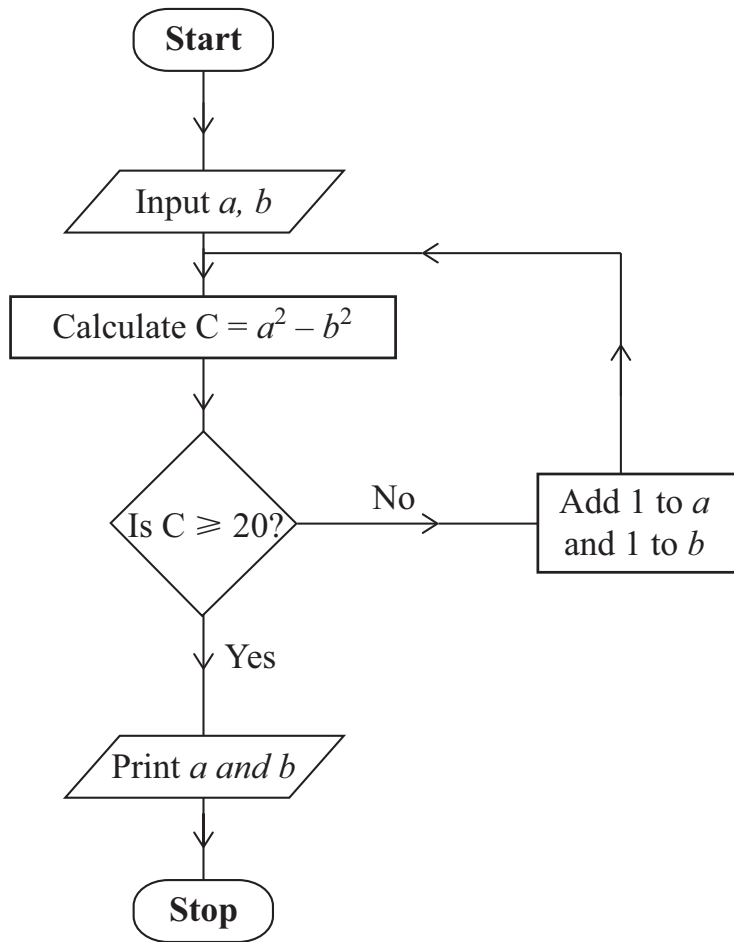
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Marks Remark

Total Question 26

Answer  $d =$  \_\_\_\_\_ metres [4]

[Turn over



Starting with  $a = 8$  and  $b = 7$  use the flow chart to find the values printed.

$a$	$b$	$C$
8	7	

Answer  $a =$  \_\_\_\_\_  $b =$  \_\_\_\_\_ [3]

Examiner Only

Marks	Remark

Total Question 27



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**THIS IS THE END OF THE QUESTION PAPER**

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For Examiner's use only	
Question Number	Marks
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<b>Total Marks</b>	
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Examiner Number

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