



Centre Number

71	
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Candidate Number

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General Certificate of Secondary Education  
2014

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**Mathematics**

Unit T2

**(With calculator)**

Foundation Tier

[GMT21]



**MV18**

TUESDAY 27 MAY, 9.15am–10.45am

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**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.**

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 at the end of each question 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

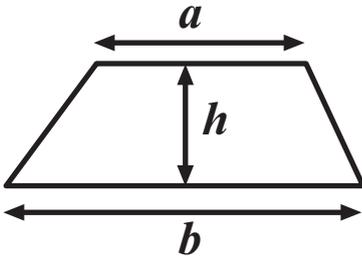
**Questions 3 and 26.**

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

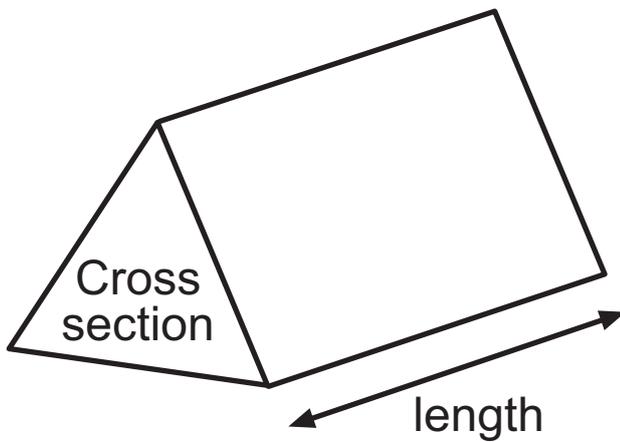
The Formula Sheet is on page 3.

# Formula Sheet

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



Volume of prism = area of cross section  $\times$  length



1 Calculate

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

Answer \_\_\_\_\_

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

Answer \_\_\_\_\_

2 Of 304 000 flights from 10 UK airports, 74% were on time.

How many flights were on time? [2 marks]

Answer \_\_\_\_\_

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

**3** Tina bought a garden ornament costing £12.75 and some shrubs.

Each shrub cost £3.15

The total cost was £31.65

How many shrubs did she buy? [3 marks]

Answer \_\_\_\_\_

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

2		5	6	7	9	
3		1	3	7	8	8 9
4		2	3	5	7	9
5		3	4	5	6	8
6		2	4	6		

Key 2 | 5 = 2.5 kg

Write down

- (a) the range, [1 mark]

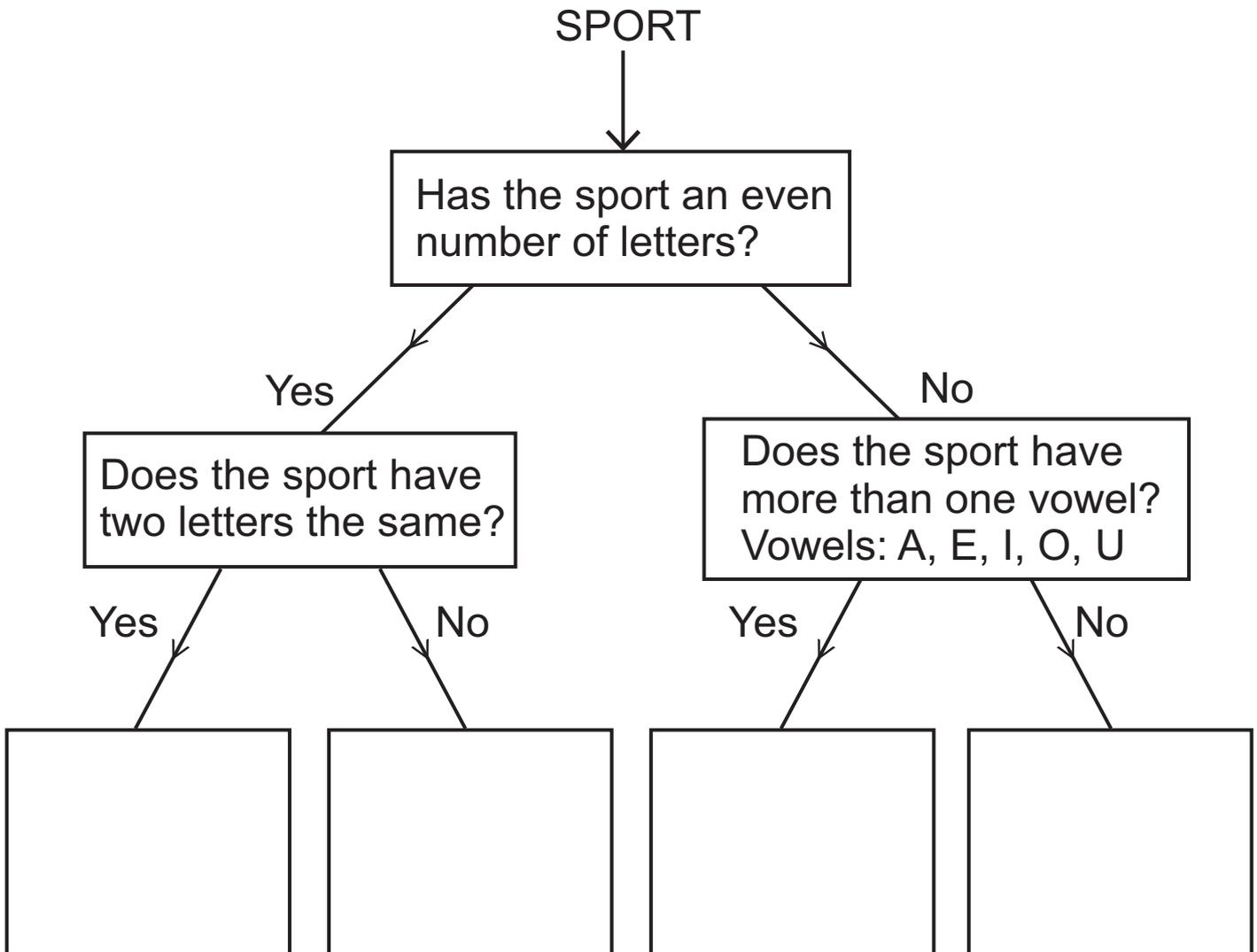
Answer \_\_\_\_\_ kg

- (b) the median. [1 mark]

Answer \_\_\_\_\_ kg

5 (a) Use the decision tree diagram to write the sports in the correct boxes. [2 marks]

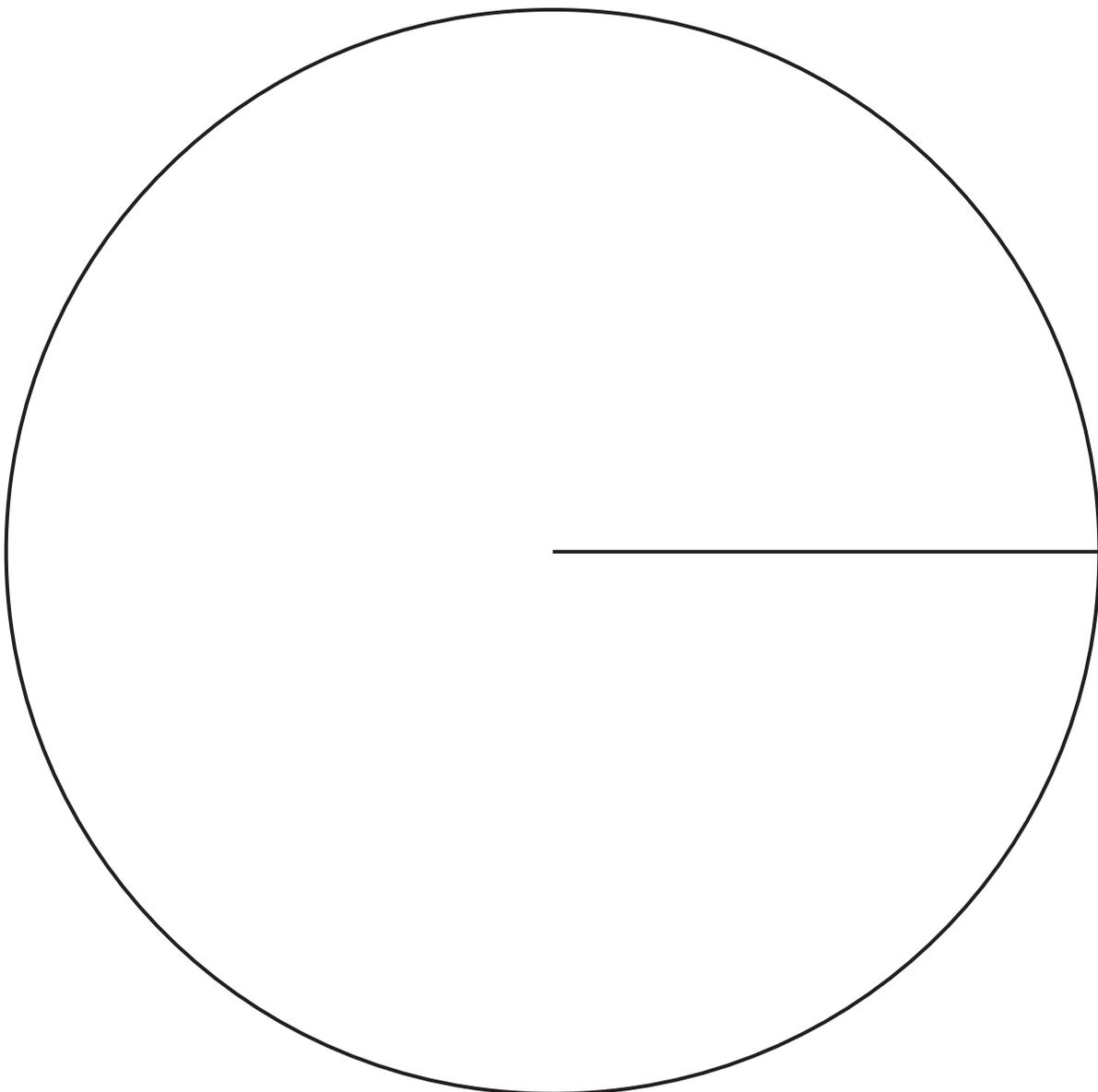
CYCLING GYMNASTICS ROWING TENNIS



(b) The number of items sold in a shop was recorded as follows.

Item	Number	Angle
Television	25	
Fridge	12	
Washing Machine	8	
Camera	15	

Draw a pie chart to illustrate this information. [4 marks]



6 (a) The diagram shows a triangle.

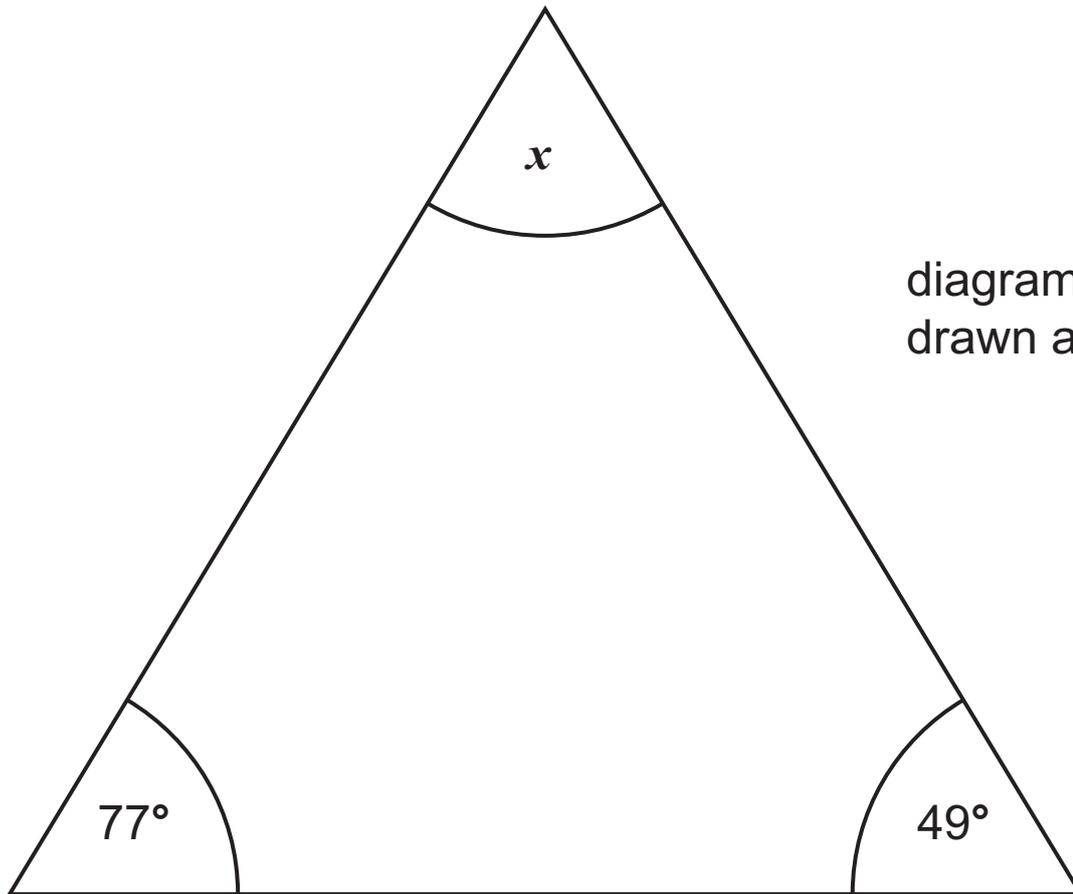


diagram not  
drawn accurately

Work out the size of the angle marked  $x$  [2 marks]

Answer  $x =$  \_\_\_\_\_  $^\circ$

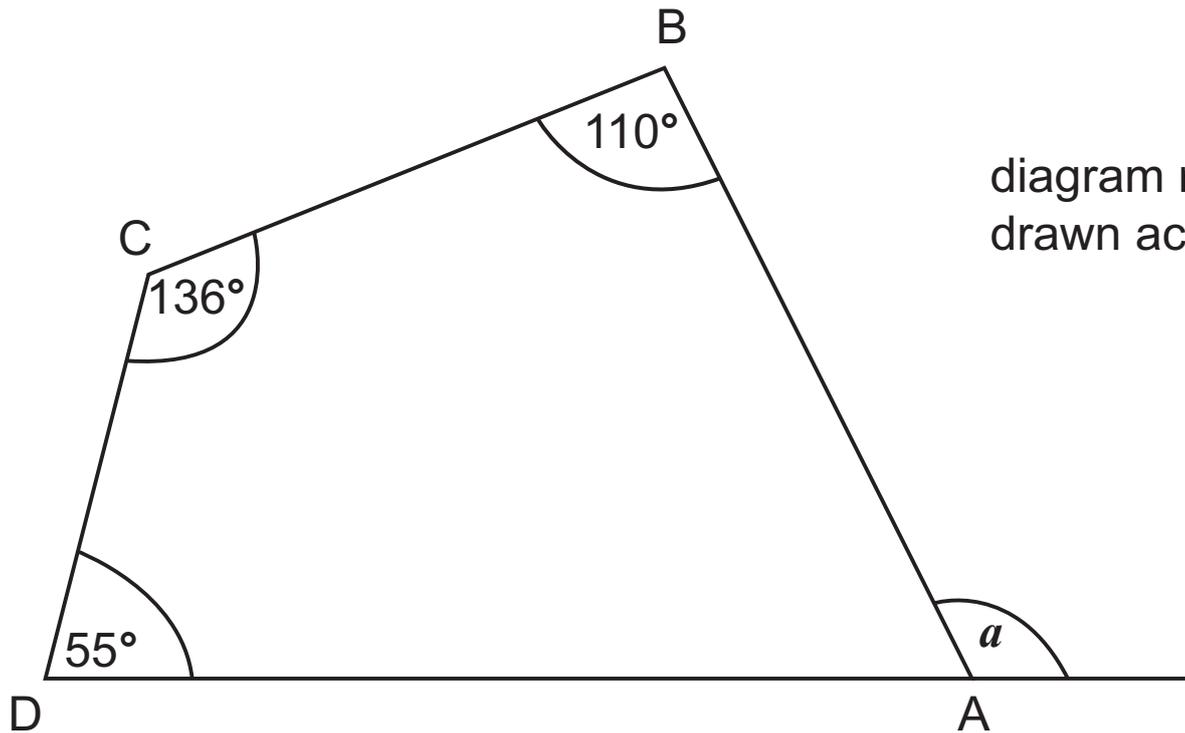
(b) A sheet of A4 paper is a rectangle 297 mm long and 210 mm wide.

Calculate the area of a sheet of A4 paper.

Give your answer in square centimetres. [2 marks]

Answer \_\_\_\_\_ cm<sup>2</sup>

(c) ABCD is a quadrilateral.

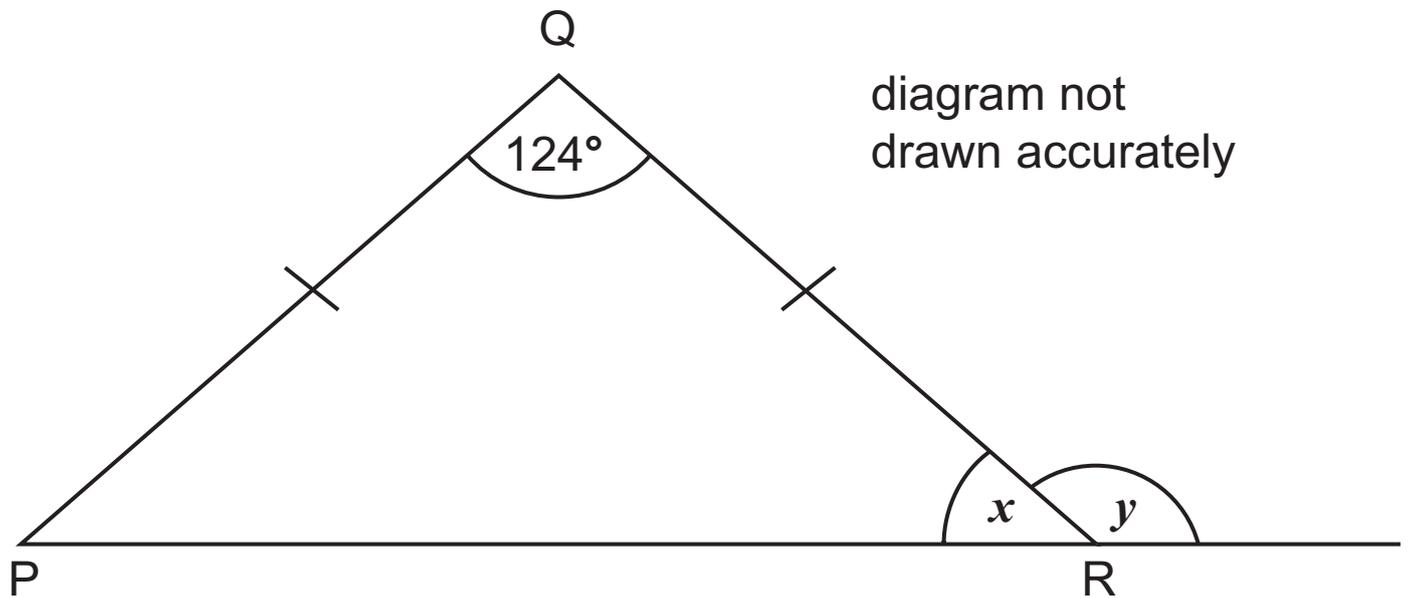


Work out the size of the exterior angle,  $a$ . [3 marks]

Answer  $a =$  \_\_\_\_\_  $^\circ$

(d) PQR is an isosceles triangle.

$$PQ = QR$$



Calculate the angles  $x$  and  $y$ . [3 marks]

Answer  $x =$  \_\_\_\_\_  $^{\circ}$

$y =$  \_\_\_\_\_  $^{\circ}$

7 Solve

(a)  $\frac{y}{4} = 12$  [1 mark]

Answer  $y =$  \_\_\_\_\_

(b)  $2d - 4 = 5$  [2 marks]

Answer  $d =$  \_\_\_\_\_

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

Answer \_\_\_\_\_

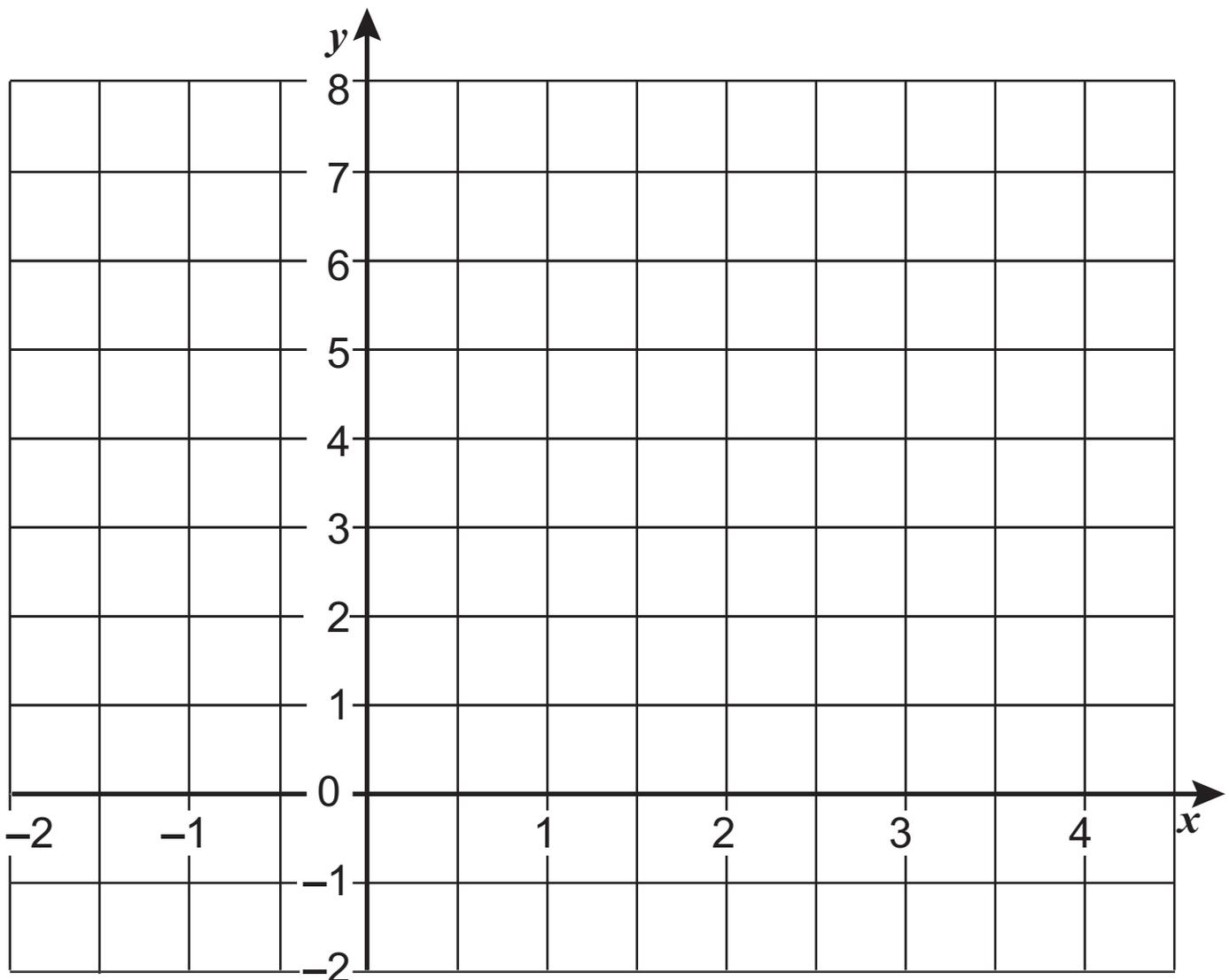
(b) Find the value of  $3x + 5y$  when  $x = -2$  and  $y = 3$   
[2 marks]

Answer \_\_\_\_\_

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

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

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

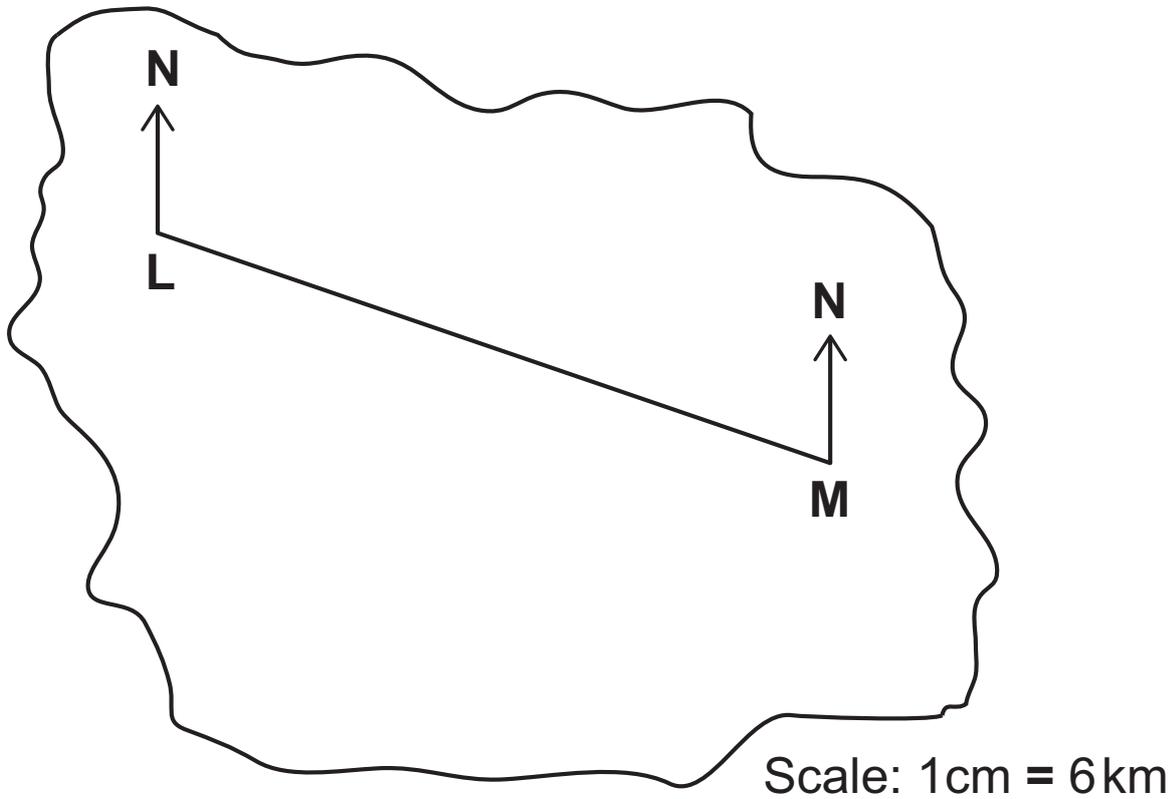


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**(Questions continue overleaf)**

10 The 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**? [1 mark]

Answer \_\_\_\_\_ °

- (b) Calculate the actual distance from **L** to **M** in kilometres.  
[2 marks]

Answer \_\_\_\_\_ km

- (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 on page 16.  
[3 marks]

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

How many tanks of this type of lawnmower can be completely filled from a 5 litre can? [2 marks]

Answer \_\_\_\_\_

**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% walk. The remainder come by car.

How many Year 8 pupils come to school by car? [3 marks]

Answer \_\_\_\_\_

**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 for Bill and by how much.  
[3 marks]

Answer Option \_\_\_\_\_ is cheaper by £ \_\_\_\_\_

**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? [2 marks]

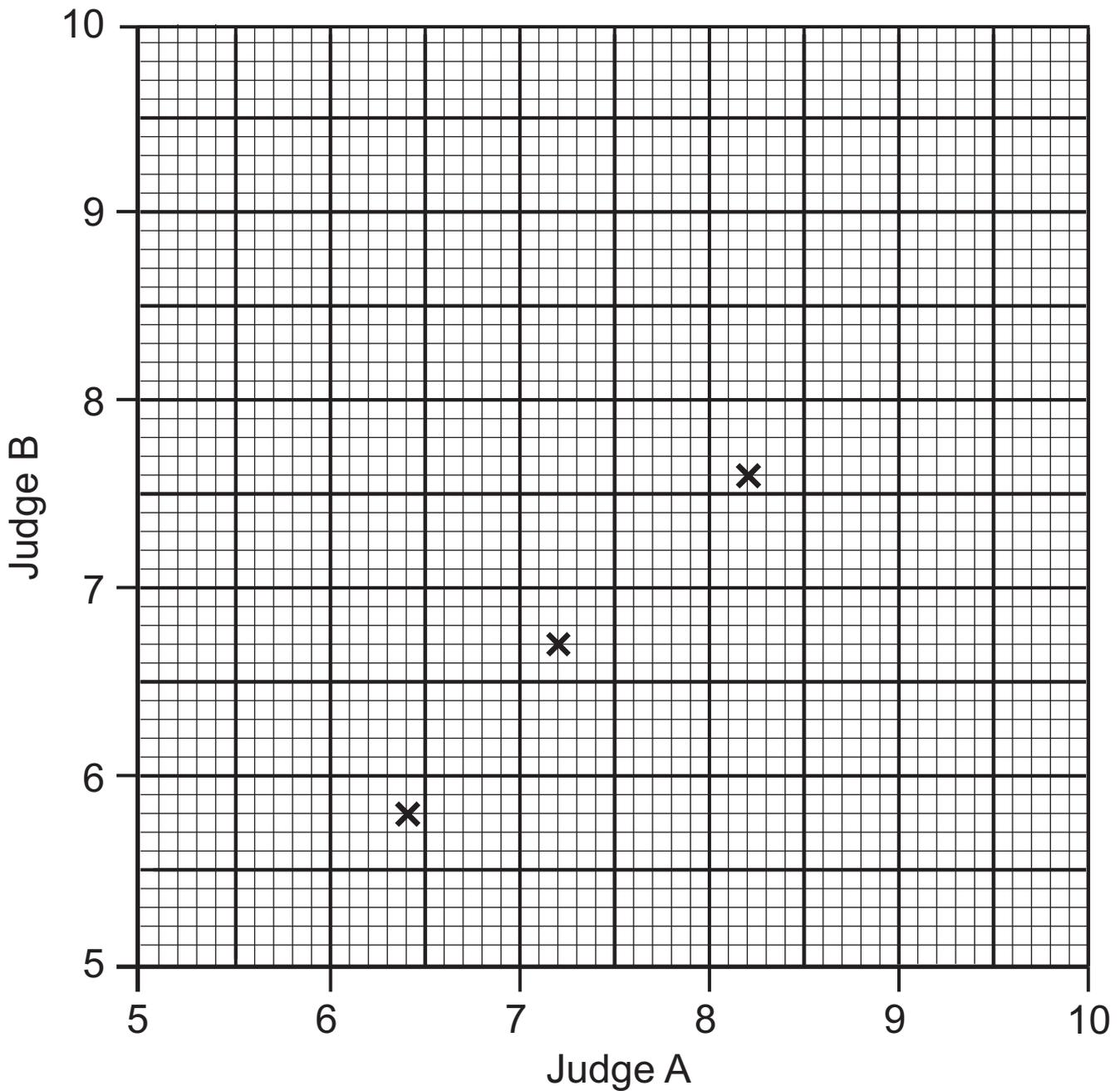
Answer \_\_\_\_\_ %

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**(Questions continue overleaf)**

15 The table shows the marks awarded by two judges to the first 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 marks]

(b) Draw the line of best fit. [1 mark]

(c) Another competitor was awarded 7.7 marks by Judge A.  
Estimate the marks awarded to this competitor by  
Judge B. [1 mark]

Answer \_\_\_\_\_

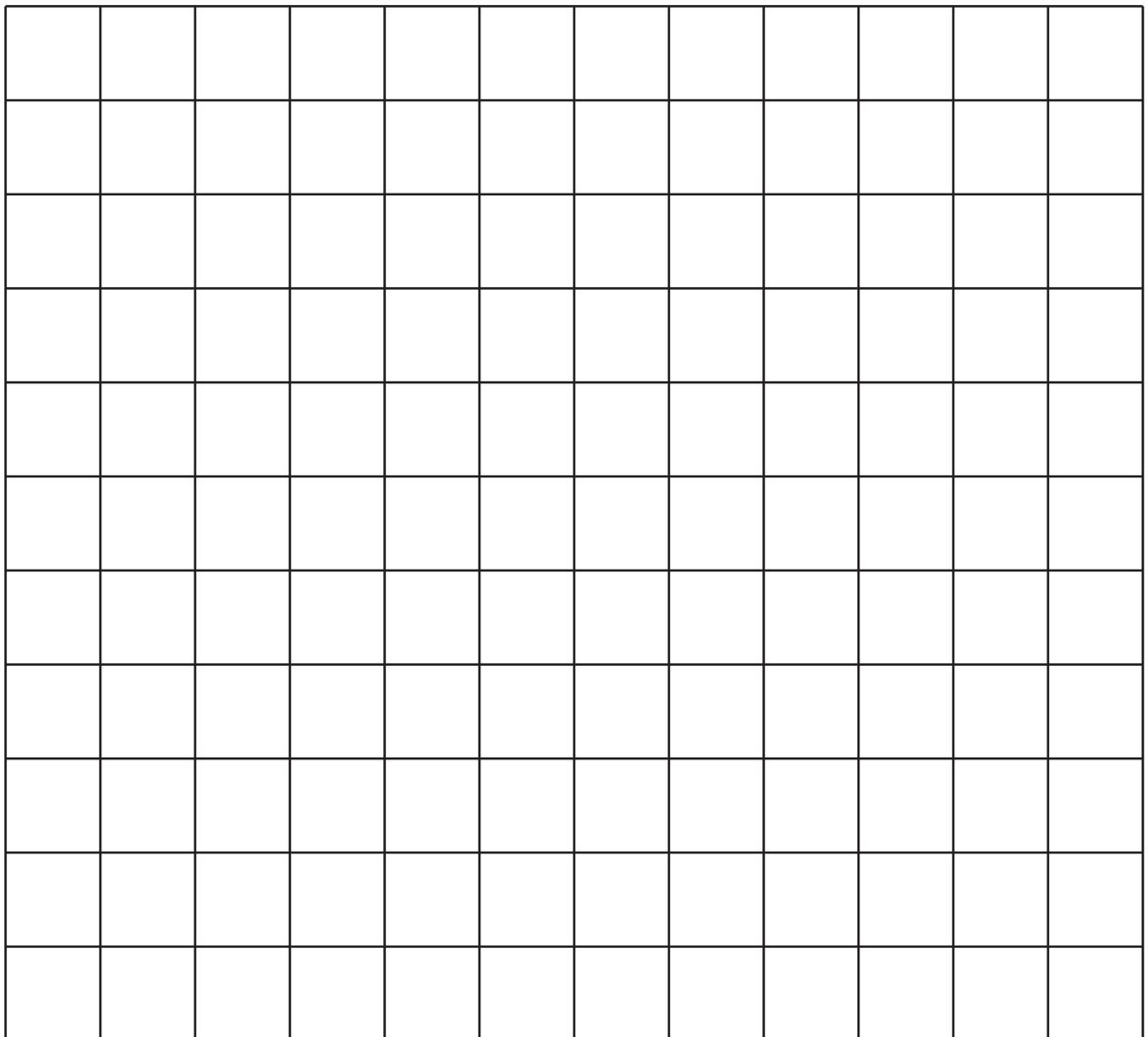
(d) What type of correlation does your graph show?  
[1 mark]

Answer \_\_\_\_\_

**16** The increase in height of 100 children over a period of time was recorded.

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 marks]



**(b)** Write down the modal class interval. [1 mark]

Answer \_\_\_\_\_

**(c)** Describe how you would construct a frequency polygon for the data. [2 marks]

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17 Donna wants to investigate the hypothesis

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

She surveys 10 girls in her class and their parents.

Give two reasons why her sample is unsuitable.

Reason 1 [1 mark] \_\_\_\_\_

\_\_\_\_\_

Reason 2 [1 mark] \_\_\_\_\_

\_\_\_\_\_

18 A window cleaning firm is employed to clean the windows of an office block.

The firm charges a basic fee of £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.  
[2 marks]

Answer \_\_\_\_\_

(b) Solve this equation to find the number of windows cleaned. [2 marks]

Answer \_\_\_\_\_ windows

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

Answer  $p =$  \_\_\_\_\_

(b) Write down the  $n$ th term for the sequence [2 marks]

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

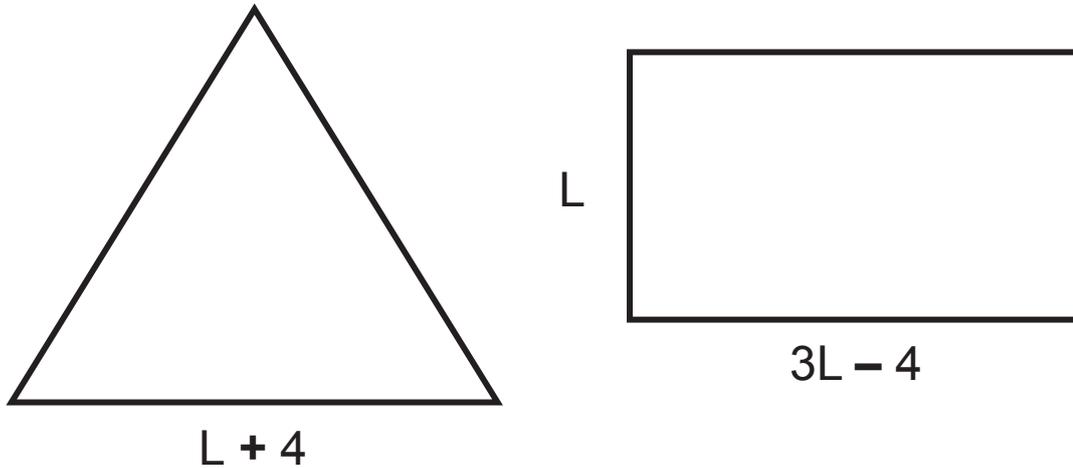
Answer \_\_\_\_\_

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

Answer \_\_\_\_\_

- 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 **perimeters** of the triangle and the rectangle are equal.

Set up and solve an equation to find the value of  $L$ .  
[3 marks]

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

Answer  $L =$  \_\_\_\_\_

**21** Express 378 as a product of prime factors. [2 marks]

Answer \_\_\_\_\_

**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? [3 marks]

Answer \_\_\_\_\_

**23** Sammy borrows £400 for nine months.

He is charged 12.5% per annum simple interest.

How much does he have to pay back? [3 marks]

Answer £ \_\_\_\_\_

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

Work out the number of sides of the polygon. [3 marks]

**Show your working.**

Answer \_\_\_\_\_ sides

25

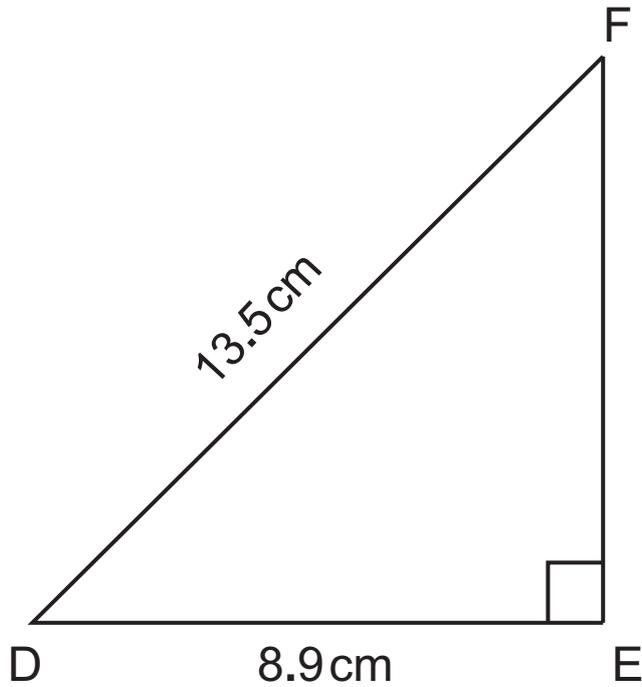


diagram not  
drawn accurately

DEF is a right-angled triangle.

$DF = 13.5 \text{ cm}$  and  $DE = 8.9 \text{ cm}$ .

Calculate the length of EF. [3 marks]

Answer EF = \_\_\_\_\_ cm

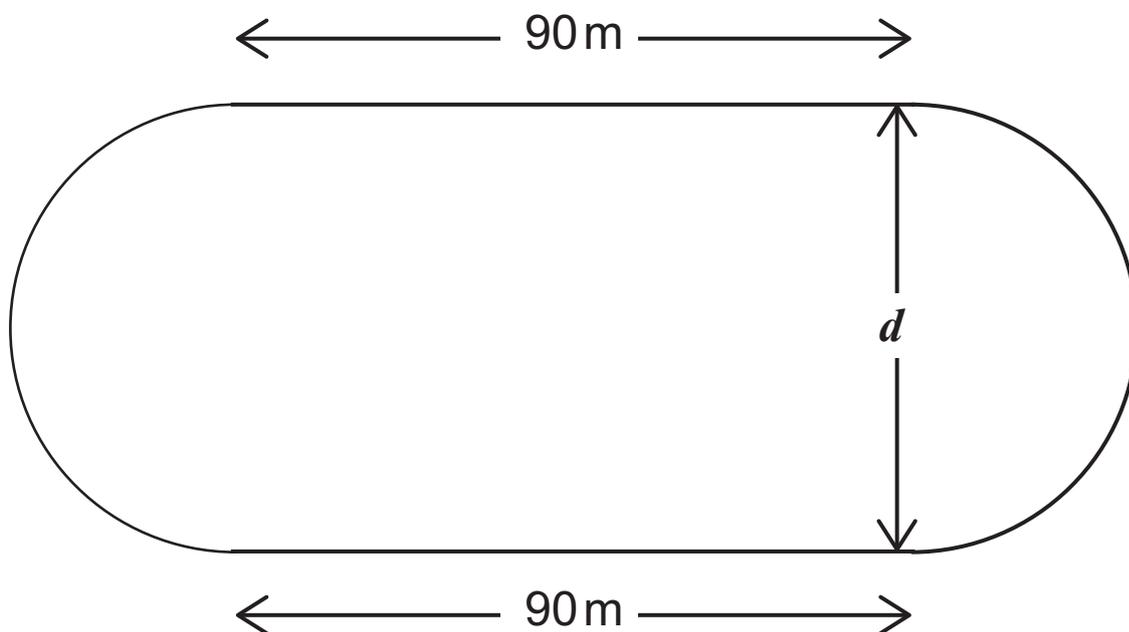
Quality of written communication will be assessed in this question.

**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.

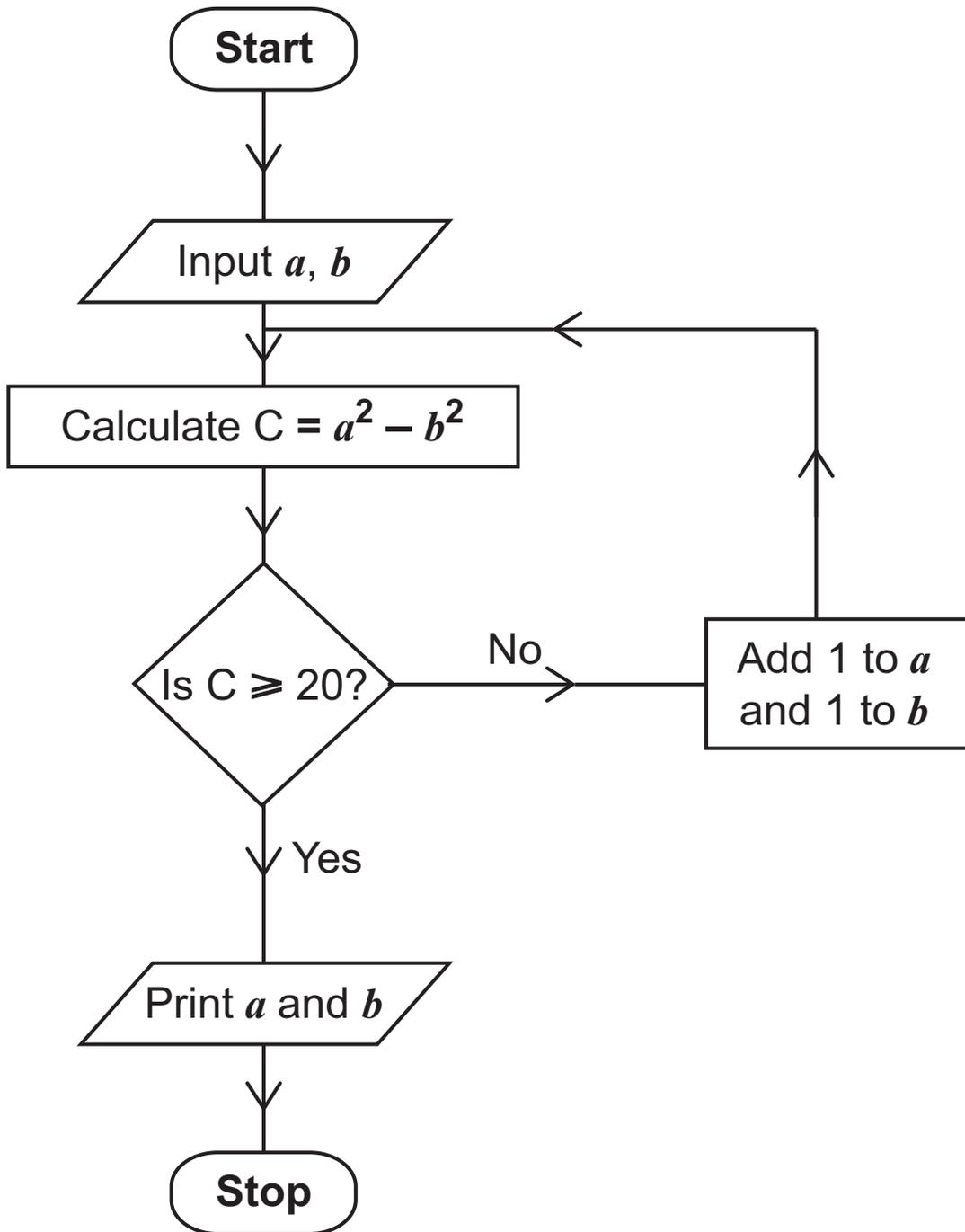
The running track has a total perimeter of 400 metres.



Calculate the distance,  $d$ , between the two straight lines.  
[4 marks]

Answer  $d =$  \_\_\_\_\_ metres

27



Starting with  $a = 8$  and  $b = 7$  use the flow chart to find the values printed. [3 marks]

$a$	$b$	C
8	7	

Answer  $a =$  \_\_\_\_\_  $b =$  \_\_\_\_\_

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

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For Examiner's use only	
Question Number	Marks
1	
2	
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<b>Total Marks</b>	
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Examiner Number

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