



General Certificate of Secondary Education
January 2018

Centre Number

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Candidate Number

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Mathematics

Unit T2
(With calculator)
Foundation Tier



MV18

[GMT21]

MONDAY 8 JANUARY, 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 on blank pages.

Complete in black ink only.

Answer **all twenty-eight** questions.

All working should be clearly shown in the spaces provided.

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.

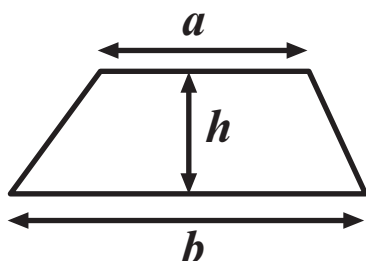
Functional Elements will be assessed in this paper.

Quality of written communication will be assessed in Questions **4** and **24**.

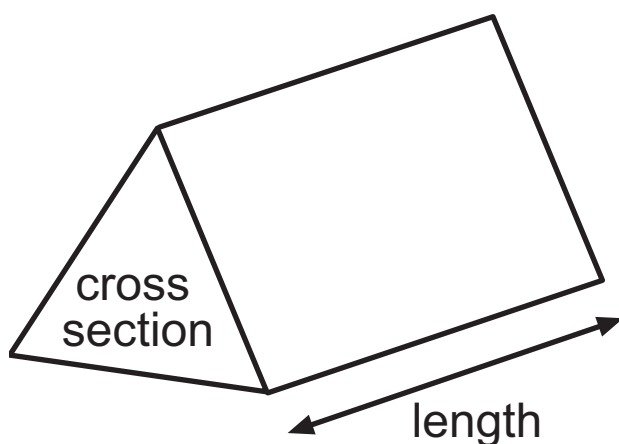
You should have a calculator, ruler, compasses and a protractor. The Formula Sheet is on page 3.

Formula Sheet

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



Volume of prism = area of cross section \times length



1 Here is a list of nine numbers

12

16

21

25

27

30

33

37

45

From the list, write down

(a) a cube number, [1 mark]

Answer _____

(b) a prime number. [1 mark]

Answer _____

- 2** A train leaves Dublin at 1755
It arrives in Cork at 2048
How many minutes does the train journey take?
[3 marks]

Answer _____ minutes

3 There are 900 students in a school.

47% of the 900 students are girls.

Work out the number of girls in the school. [2 marks]

Answer _____

Quality of written communication will be assessed in this question.

- 4** Erin says, “There are 30 boys in my sports club (to the nearest 10) and 20 girls (to the nearest 10), so there must be 50 pupils to the nearest 10”

Is she right or wrong? [3 marks]

You must show working to explain your answer.

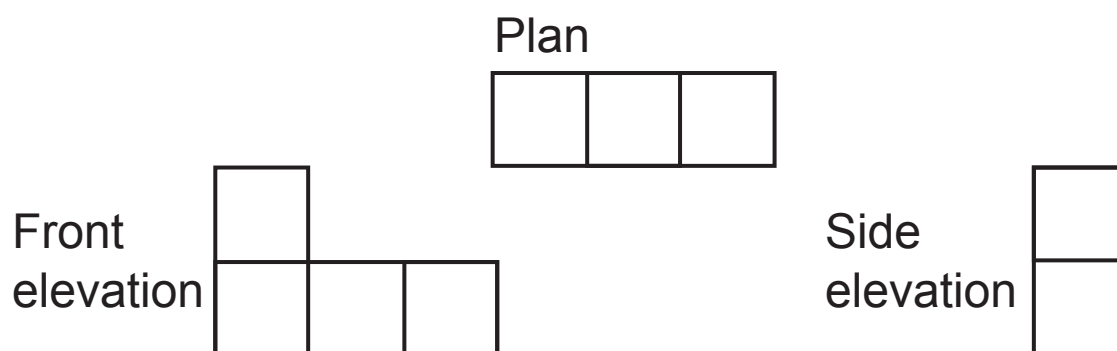
- 5 The table below shows some rows of a number pattern.

Row 1	$3^2 - 1^2 = 4 \times 2$
Row 2	$4^2 - 2^2 = 4 \times 3$
Row 3	$5^2 - 3^2 = 4 \times 4$

Complete Row 10 of the number pattern. [2 marks]

Row 10	
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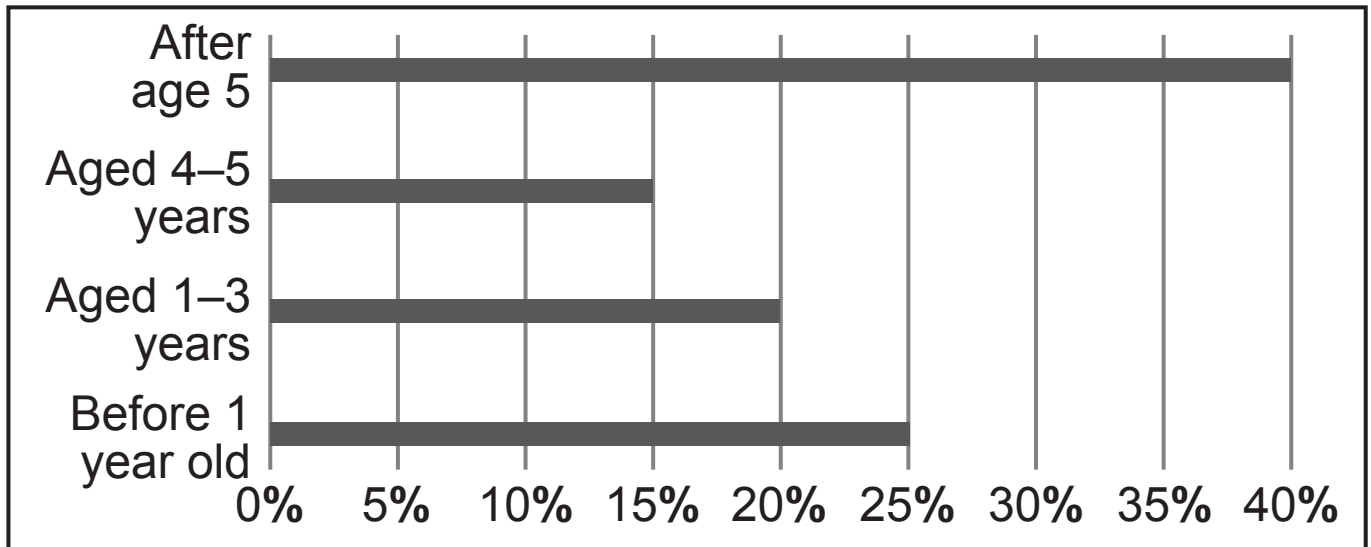
- 6 The diagrams below show the plan, the front elevation and the side elevation of a 3D shape.



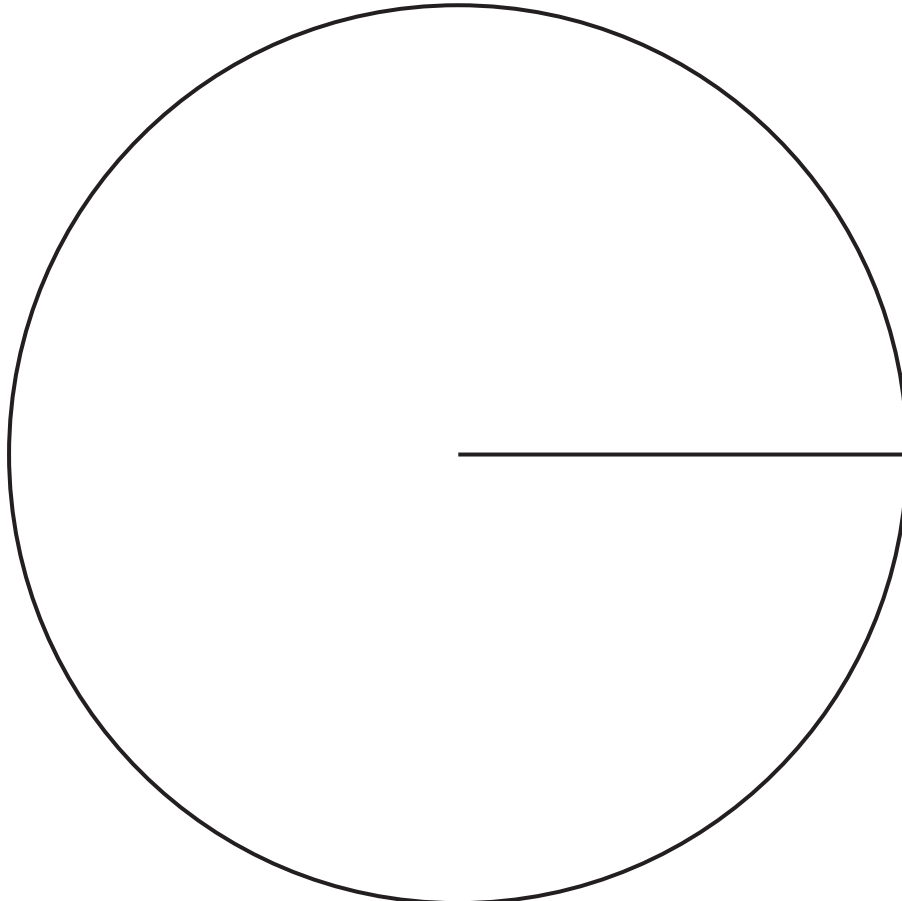
Draw a sketch of the 3D shape below. [2 marks]

- 7 A survey was carried out to find the ages at which children were taken on their first holiday abroad.

The bar chart shows the results.



Draw a pie chart to show these results. [4 marks]



8 Mary buys 4 kg of carrots and 300 g of peas.

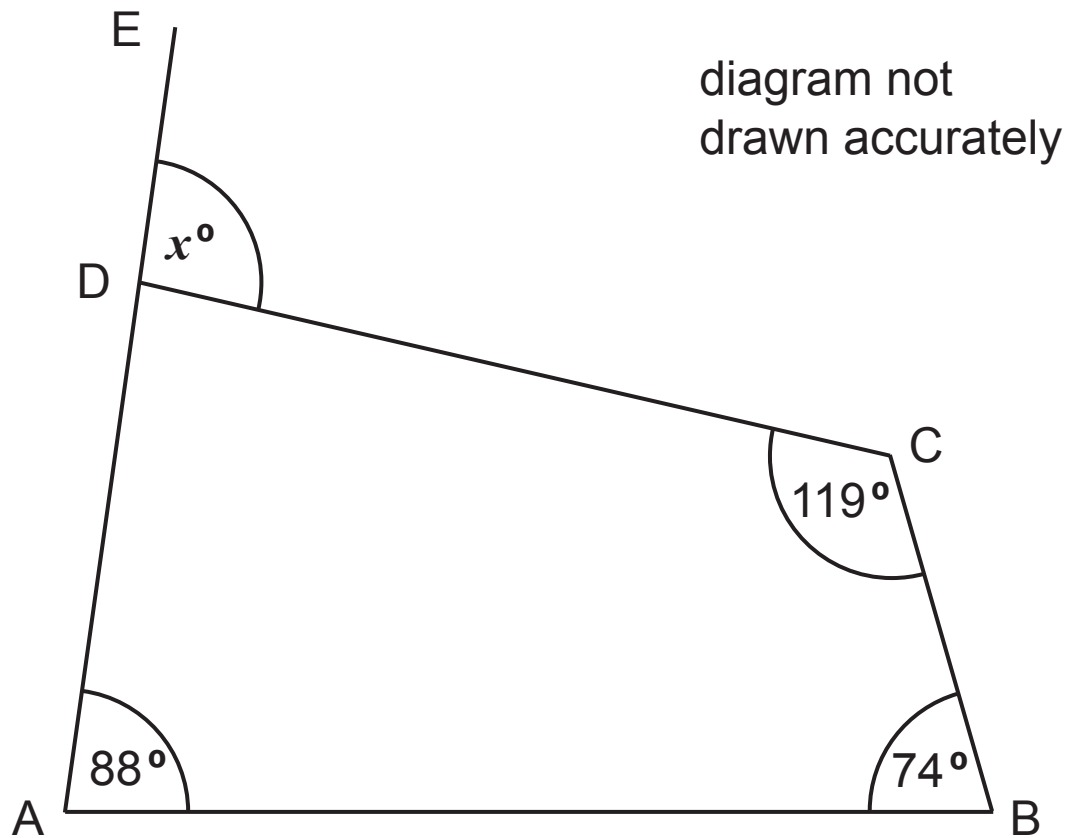
The total cost is £6.44

1 kg of peas costs £1.60

Work out the cost of 1 kg of carrots. [4 marks]

Answer £ _____

9



Work out the size of the angle marked x . [3 marks]

Answer _____ $^\circ$

10 (a) Simplify

$$3a - 5b + a + 2b \quad [2 \text{ marks}]$$

Answer _____

(b) Solve the following equations

(i) $\frac{w}{3} = 15$ [1 mark]

Answer $w =$ _____

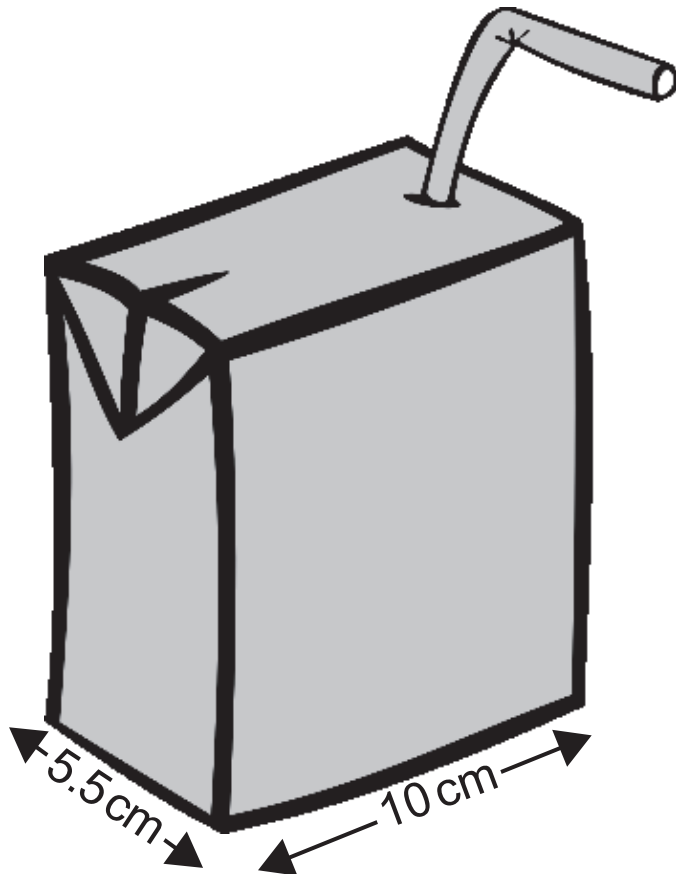
(ii) $8y - 3 = 37$ [2 marks]

Answer $y =$ _____

(c) Find the value of $5d + 4e$ when $d = -3$ and $e = 2$
[2 marks]

Answer _____

11



Lily has a carton of juice as shown above.
The carton is in the shape of a cuboid.
The volume of the carton is 990 cm^3
Work out the height of the carton. [2 marks]

Answer _____ cm

12 Sean hired a small digger. It cost £101.88 for the first day.

It cost £33.96 for each extra day.

Sean paid a total of £305.64

For how many days did he hire the small digger?
[3 marks]

Answer _____ days

13 Karan uses $\frac{2}{5}$ of a tin of baby food each day for her baby.

Karan and her baby are going on a 7-day holiday.

What is the least number of tins of baby food that Karan must bring with her? [3 marks]

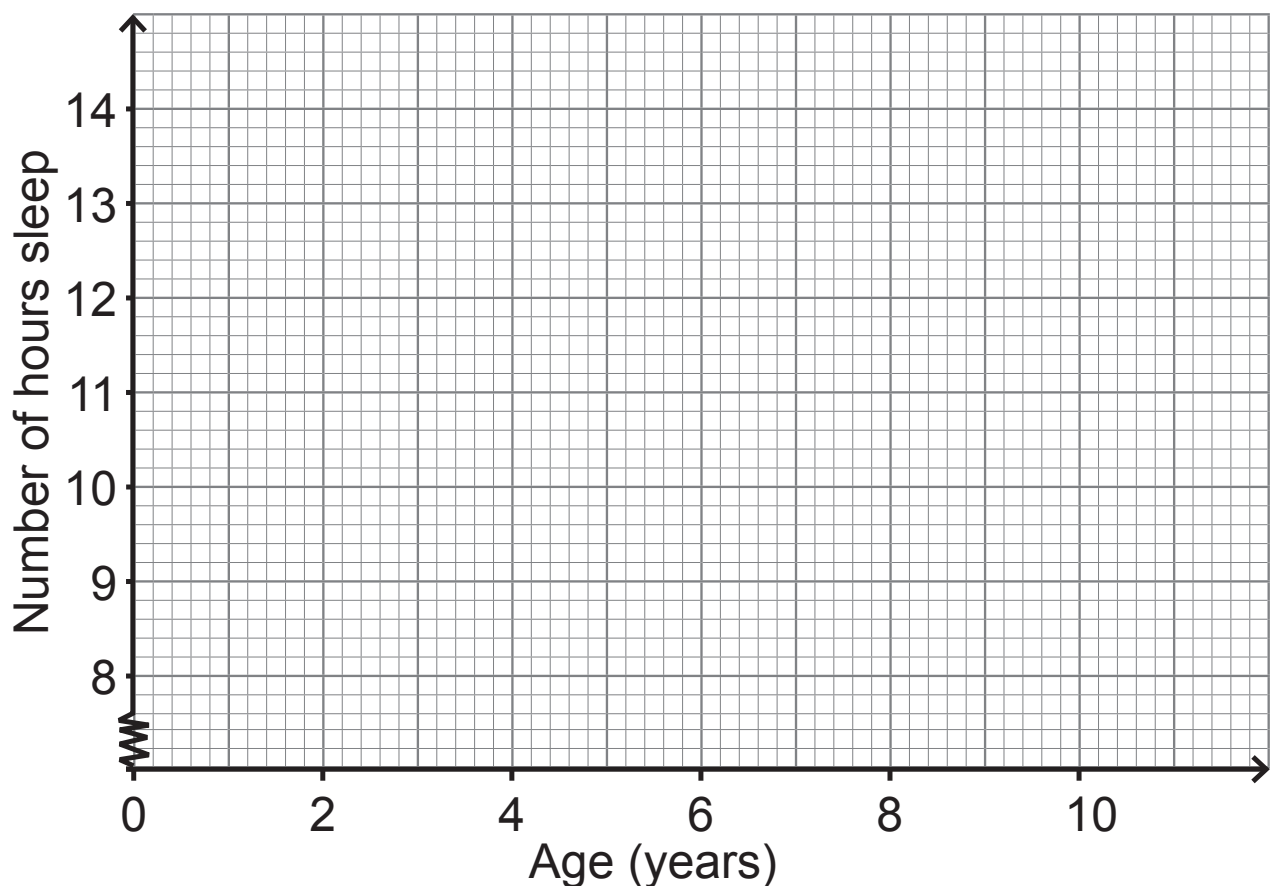
Show your working.

Answer _____ tins

14 The table below shows the ages of seven children and the number of hours sleep each child had last night.

Age (years)	4	5	6	7	8	10	11
Number of hours sleep	13	12	12.5	11.5	11.4	10.8	10

(a) Use the grid below to show this information on a scatter graph. [2 marks]

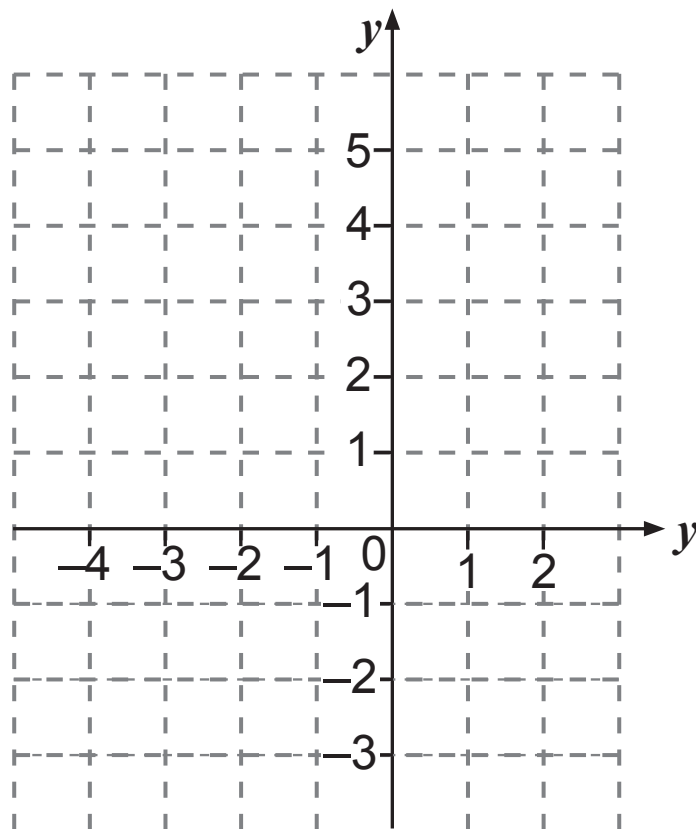


(b) Draw a line of best fit on the scatter graph. [1 mark]

- (c) Use your line of best fit to estimate the number of hours sleep for a 9 year-old child last night. [1 mark]

Answer _____ hours

15



P is the point $(-4, 3)$ and Q is the point $(0, -2)$.

Find the co-ordinates of the midpoint of PQ. [2 marks]

Answer (_____ , _____)

16

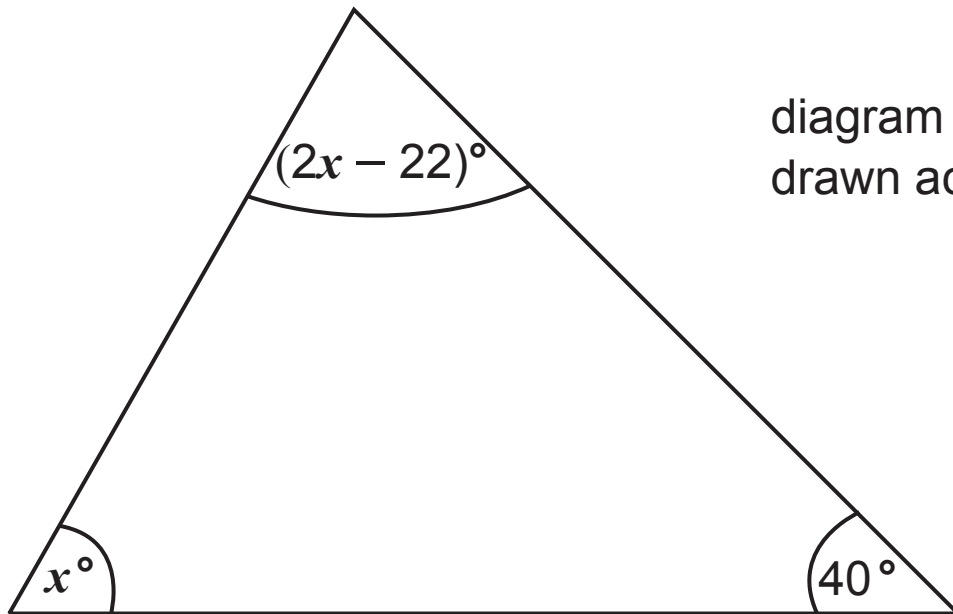


diagram not
drawn accurately

The diagram shows a triangle with angles of 40° , x° and $(2x - 22)^\circ$

Work out the value of x . [4 marks]

Answer $x =$ _____

17 Here are the ages, in years, of 21 teachers.

45	35	52	42	27	36	49
23	31	47	50	55	34	41
37	44	30	28	45	53	26

(a) Draw a stem and leaf diagram to show this data.
[3 marks]

(b) Work out

(i) the median age, [1 mark]

Answer _____

(ii) the range of the ages. [1 mark]

Answer _____

18

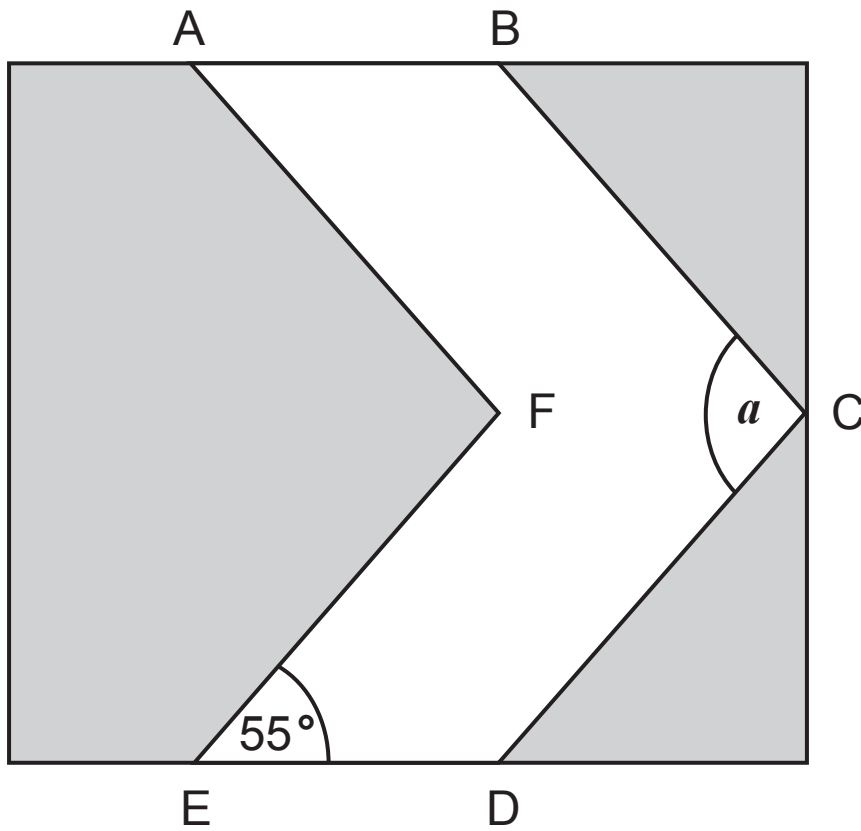


diagram not
drawn accurately

The diagram opposite shows a symmetrical road sign.

AB is parallel to ED.

AF is parallel to BC.

EF is parallel to DC.

The angle $DEF = 55^\circ$

Work out the size of angle a . [2 marks]

Answer _____ $^\circ$

19 To work out a gas bill each month, the Gas Company charges 4.12p for each unit of gas used.

There is also a fixed charge of 9.43p per day.

Finally, VAT at 5% is added to the total amount.

Conor used 2435 units of gas during November.

Work out his monthly gas bill for November. [5 marks]

Answer £ _____

- 20** Twenty-five students scored goals for the school team last month.

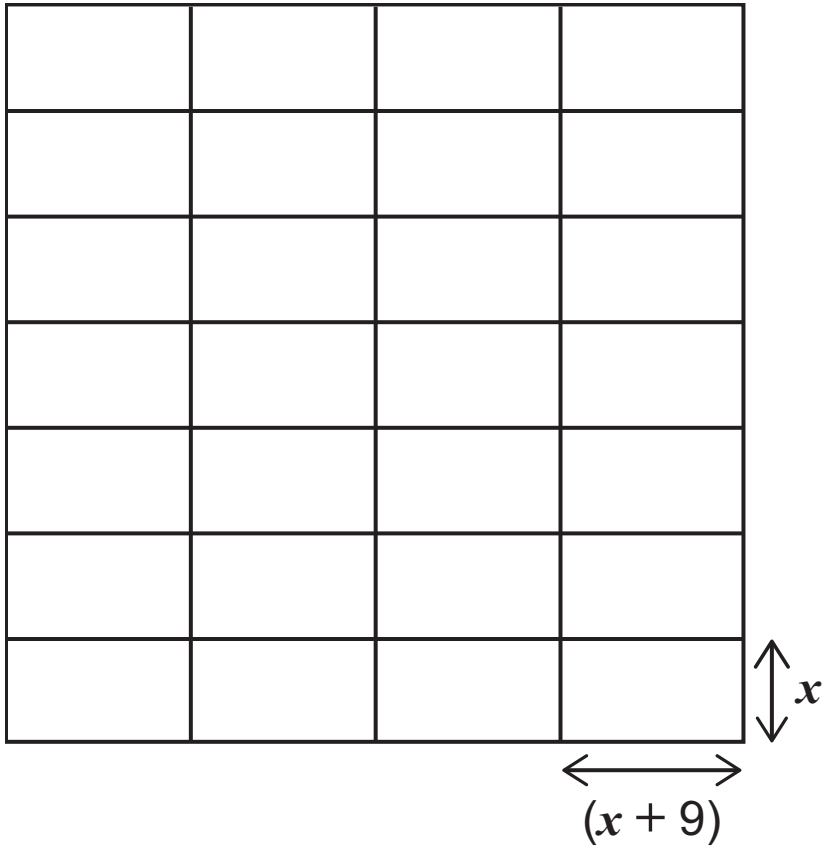
The table gives information about the number of goals they scored.

Goals scored	Number of students	
1	12	
2	7	
3	4	
4	2	

Work out the mean number of goals scored per student last month. [3 marks]

Answer _____

21



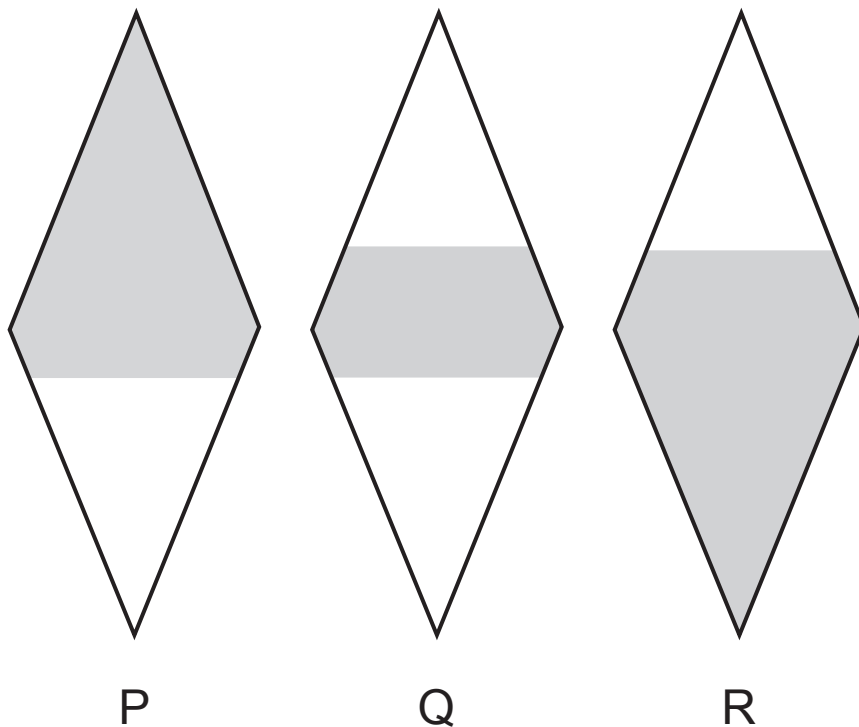
The diagram opposite shows how 28 rectangular tiles have been arranged on a kitchen wall to produce a square.

Each tile has a width of x cm and a length of $(x + 9)$ cm.

Form an equation in x and solve it to find the value of x .
[4 marks]

Answer $x =$ _____

22



P, Q and R are three identical shapes.

$\frac{3}{5}$ of P is shaded.

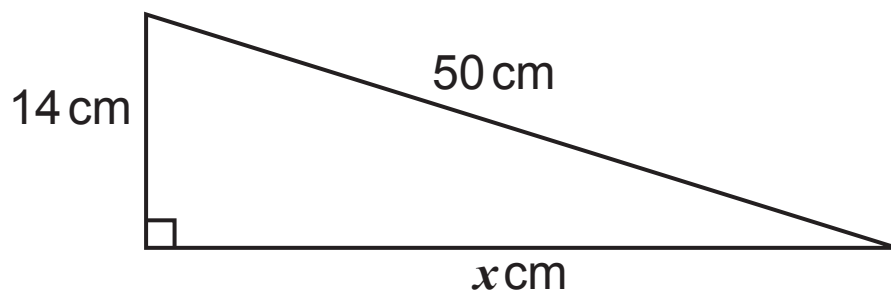
$\frac{5}{8}$ of R is shaded.

What percentage of Q is shaded? [4 marks]

Show all your working clearly.

Answer _____ %

23



Calculate the value of x . [3 marks]

Answer _____

Quality of written communication will be assessed in this question.

24 (a) Which of the angles listed below could be the interior angle of a regular polygon?

Circle all the correct answers. [4 marks]

You must show all your working.

140°

135°

130°

125°

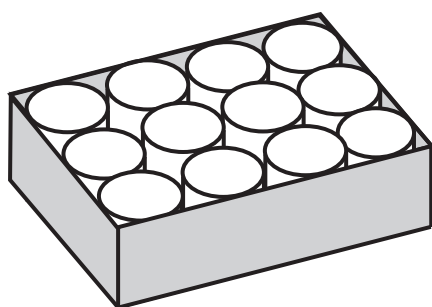
120°

115°

(b) Choose one of your answers to **(a)** and write down the name of the polygon. [1 mark]

Answer: The polygon with interior angle of _____° is called a _____

- 25** A box just holds 12 cylindrical tins as shown.
The diameter of each tin is 8 cm.



Calculate the area of the base of the box **not** covered by the tins. [5 marks]

Answer _____ cm^2

26 (a) Expand and simplify [2 marks]

$$a(a + b) + 3b(a - 2)$$

Answer _____

(b) Solve $\frac{x}{3} - \frac{1}{2} = 4$ [3 marks]

Answer $x =$ _____

(c) Write down an expression for the n^{th} term of the sequence [2 marks]

4, 7, 10, 13, 16, ...

Answer _____

27 A solution to the equation $x^3 - 4x = 82$ lies between $x = 4$ and $x = 5$

Use trial and improvement to solve this equation.

Give your answer correct to 1 decimal place. [3 marks]

Show all your working clearly.

x	$x^3 - 4x$	

Answer $x =$ _____

- 28 (a)** Given that $1001 = 7 \times 11 \times 13$, write 9009 as a product of primes. [2 marks]

Answer _____

- (b)** Given that $945 = 3^3 \times 5 \times 7$, use **(a)** to find the HCF of 945 and 9009 [2 marks]

Answer _____

THIS IS THE END OF THE QUESTION PAPER

DO NOT WRITE ON THIS PAGE

For Examiner's use only	
Question Number	Marks
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Total Marks	
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Examiner Number

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