Version 1.0

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
3	
4 – 5	
6 – 7	
8 – 9	
10 – 11	
12 – 13	
14 – 15	
16 – 17	
18 – 19	
20	
TOTAL	

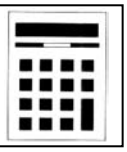
General Certificate of Secondary Education
Foundation Tier

Mathematics 43603F

Unit 3 Foundation Tier

Specimen Paper 2012 Specification

F

For this paper you must have: • a calculator • mathematical instruments.	

Time allowed
- 1 hour 30 minutes

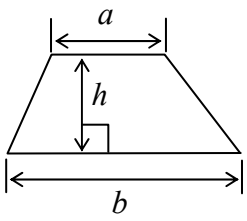
Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the space provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work that you do not want to be marked.
- If your calculator does not have a π button, take the value of π to be 3.14 unless another value is given in the question.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- The quality of your written communication is specifically assessed in questions 2 and 18.
  These questions are indicated with an asterisk (✳)
- You may ask for more answer paper, graph paper and tracing paper.
  These must be tagged securely to this answer booklet.

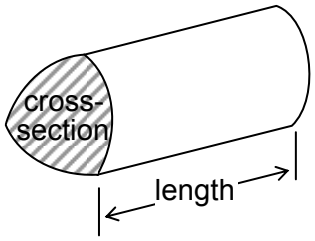
Advice
- In all calculations, show clearly how you work out your answer.

Formulae Sheet: Foundation Tier

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

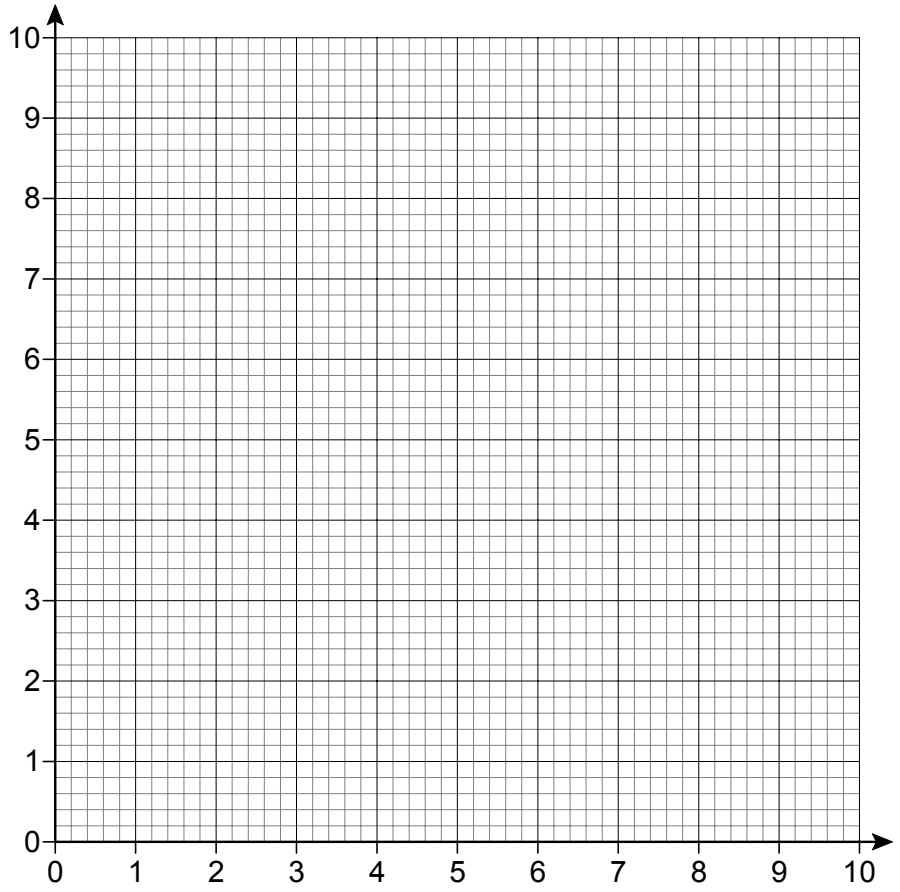


Volume of prism = area of cross-section × length



Answer **all** questions in the spaces provided.

1 (a) Here is a centimetre grid.



Plot four points *A, B, C* and *D* on the grid to make a rectangle *ABCD* of length 6 cm and width 4 cm.

(2 marks)

1 (b) Tick whether each statement is always true, sometimes true or never true.

1 (b) (i) Rectangles with an area of 24 cm^2 have a length of 6 cm.

☐ Always true ☐ Sometimes true ☐ Never true

(1 mark)

1 (b) (ii) Rectangles with a perimeter of 20 cm have a length of 12 cm.

☐ Always true ☐ Sometimes true ☐ Never true

(1 mark)

1 (b) (iii) Rectangles with length 6 cm and width 4 cm have area 24 cm^2 and perimeter 20 cm.

☐ Always true ☐ Sometimes true ☐ Never true

(1 mark)

5

Turn over ▶

✳**2** Greg goes shopping with £20.
He spends £5.60 on his lunch.
He needs £1.30 for his bus fare.
He sees this advert for shoes.

Shoes

Normal Price £15

Sale price 10% off normal price

Does he have enough money to buy them?

You **must** show your working

.....

.....

.....

.....

.....

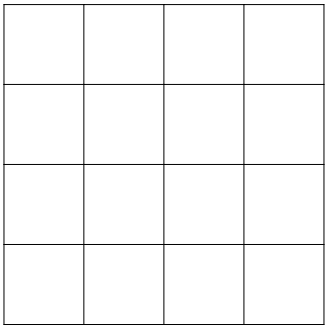
.....

.....

(4 marks)

3 (a) How many sixteenths are there in $\frac{3}{4}$?

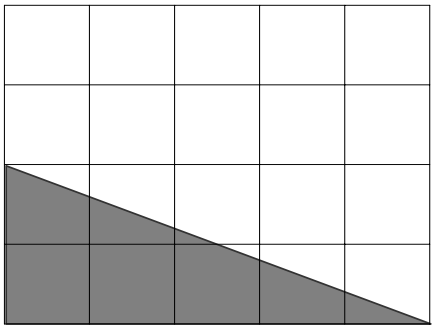
You may use this grid to help you.



.....

Answer ..... *(2 marks)*

3 (b) A triangle on this grid is shaded.



What percentage of the grid is shaded?

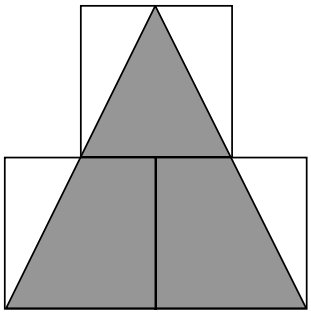
.....

.....

.....

Answer ..... % *(2 marks)*

3 (c) This shape consists of 3 equal squares.



What fraction of the shape is covered by the triangle?

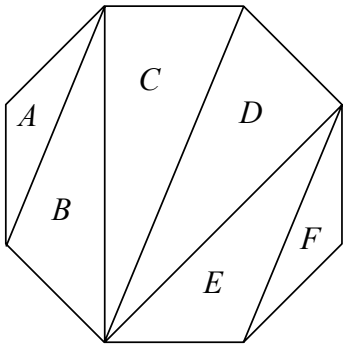
.....

.....

Answer ..... *(2 marks)*

10

4 A regular octagon is split into triangles A, B, C, D, E and F.



4 (a) Complete this list of pairs of congruent triangles.

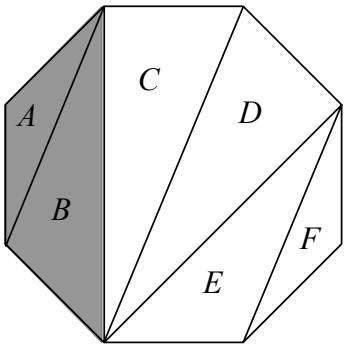
C and D

B and .....

A and .....

(2 marks)

4 (b) Triangles A and B make a trapezium as shown.

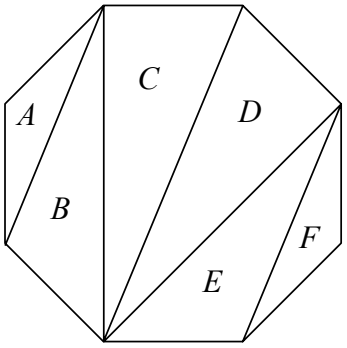


Which of the following triangles also make a trapezium?
Circle your answers.

B and C C and D D and E E and F

(2 marks)

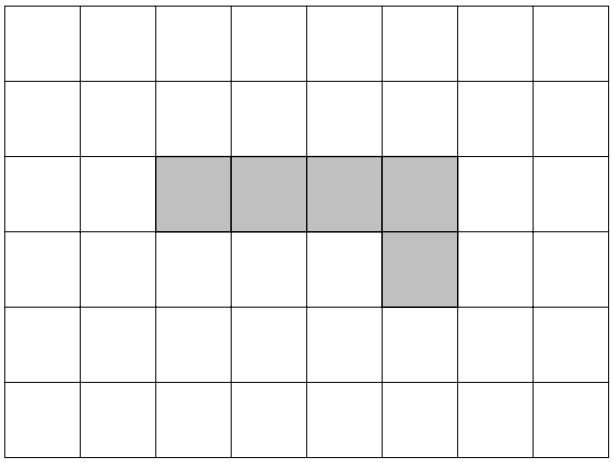
4 (c) Shade **two** triangles in this diagram to make a kite.



(1 mark)

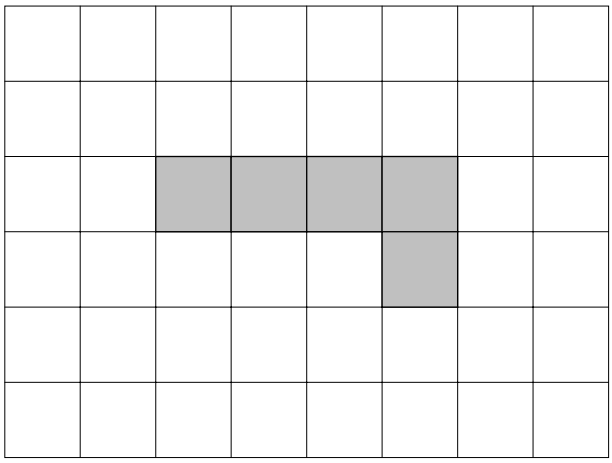
Do not write outside the box

5 (a) Shade **one** more square to make a shape with one line of symmetry.



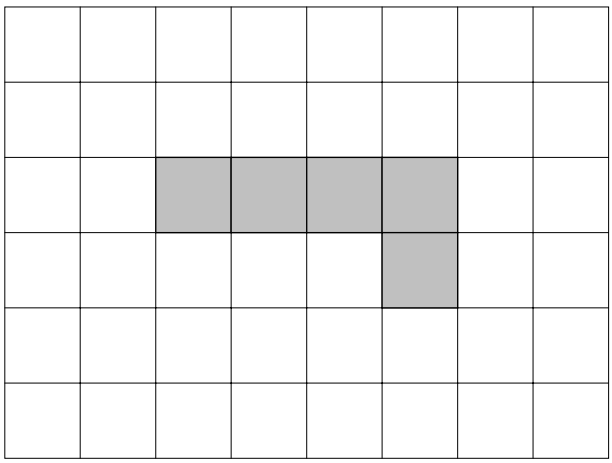
(1 mark)

5 (b) Shade **one** more square to make a different shape with one line of symmetry.



(1 mark)

5 (c) Shade **one** more square to make a shape with rotational symmetry of order 2.

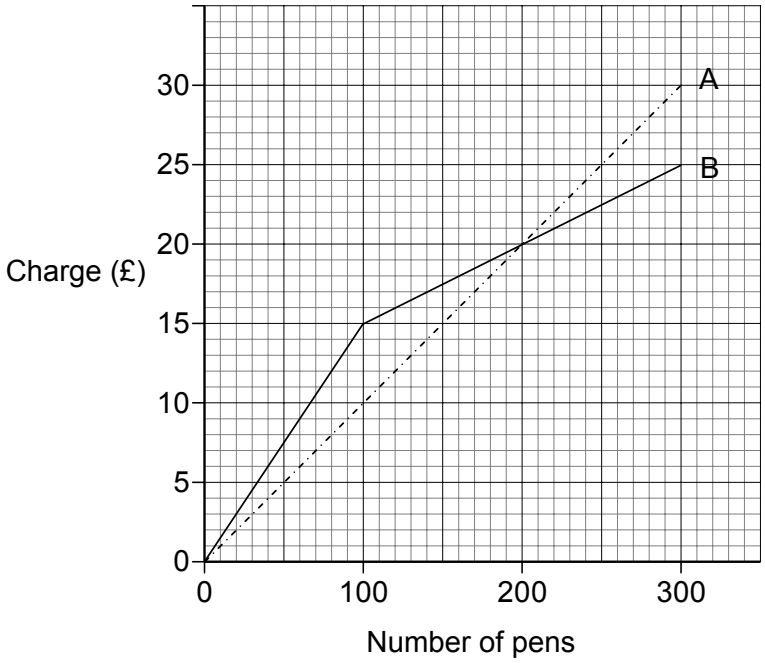


(1 mark)

8

6 Two companies A and B sell pens.

The graph shows how much each company charges.



6 (a) (i) How much does company B charge for 100 pens?

Answer £ ..... *(1 mark)*

6 (a) (ii) Which company would you buy 100 pens from?

Give a reason for your answer.

.....

.....

.....

(2 marks)

Do not write outside the box

6 (b) Two shops, The Pen Shop and News Box, buy some pens.

6 (b) (i) The Pen Shop spends £25 on pens.

How many more pens can they buy from company B than company A?

.....

.....

.....

.....

Answer ..... *(2 marks)*

6 (b) (ii) Buying 200 pens from Company A or Company B costs the same amount.

News Box buys 200 pens.
They sell the pens for 25 pence each.

How many pens do they need to sell to cover the cost of buying the pens?

.....

.....

.....

.....

.....

.....

.....

Answer ..... *(3 marks)*

8

7 (a) If $x \diamond y$ means $2x + y$ find the value of $2 \diamond 8$

.....

Answer ..... *(1 mark)*

7 (b) If $m \blacktriangledown n$ means $\frac{m+n}{2}$ find the value of $4 \blacktriangledown 10$

.....

Answer ..... *(2 marks)*

7 (c) Simplify $6a + 7b - 2a + b$

.....

.....

Answer ..... *(2 marks)*

7 (d) Solve the equation $5w + 6 = 9 - w$

.....

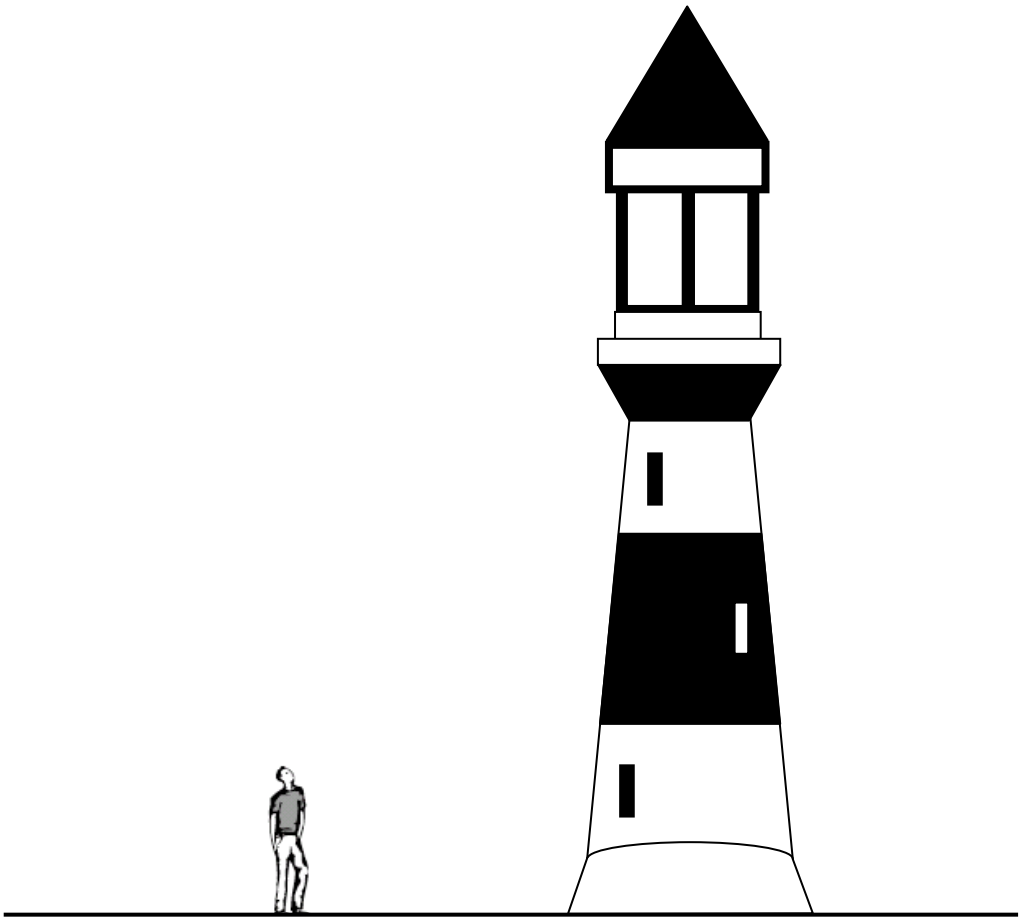
.....

.....

.....

Answer $w =$ ..... *(3 marks)*

8 Use the diagram to estimate the height of the lighthouse.



.....

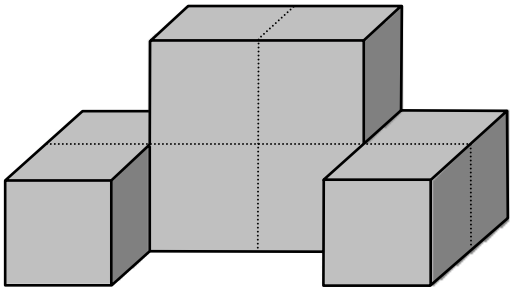
.....

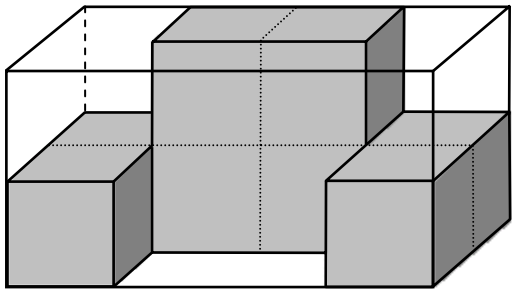
Answer ..... m *(3 marks)*

Turn over for the next question

11

9 Centimetre cubes are fitted together to make a solid as shown on the left.





The solid is packed into a box as shown on the right.
The box is a cuboid.

Work out the volume of the box.

.....

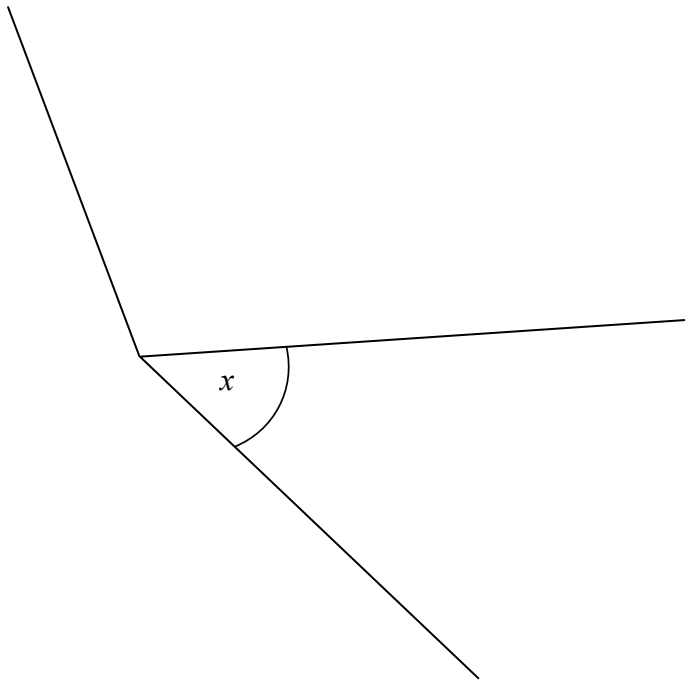
.....

.....

Answer ..... cm^3 *(3 marks)*

10 Viki is cutting angles out of paper to fit together exactly at a point as shown.

She cuts out an acute angle, an obtuse angle and a reflex angle.



10 (a) Measure the size of the acute angle, marked x, on the diagram.

Answer ..... degrees *(1 mark)*

10 (b) Viki starts again using three different angles.

Choose three different angles, one acute, one obtuse and one reflex, which fit together exactly at a point.

.....

.....

.....

Answer Acute = ... degrees

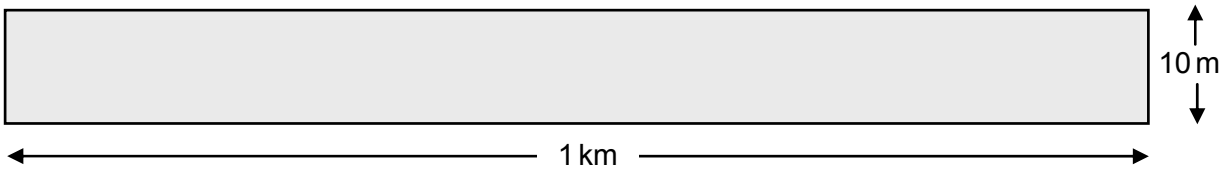
Obtuse = ... degrees

Reflex = ... degrees *(3 marks)*

7

11 Large areas can be measured in hectares.

1 hectare is $10\,000\,m^2$.



11 (a) Explain why the diagram represents 1 hectare.

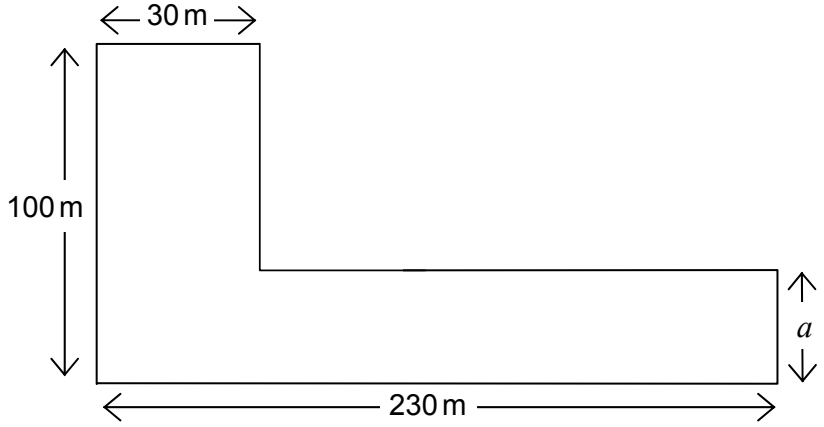
.....

.....

(1 mark)

11 (b) This L–shape has an area of one hectare.

All lengths are a whole number of metres.



Not drawn accurately

Work out the value of a.

Give your answer in metres.

.....

.....

.....

.....

.....

.....

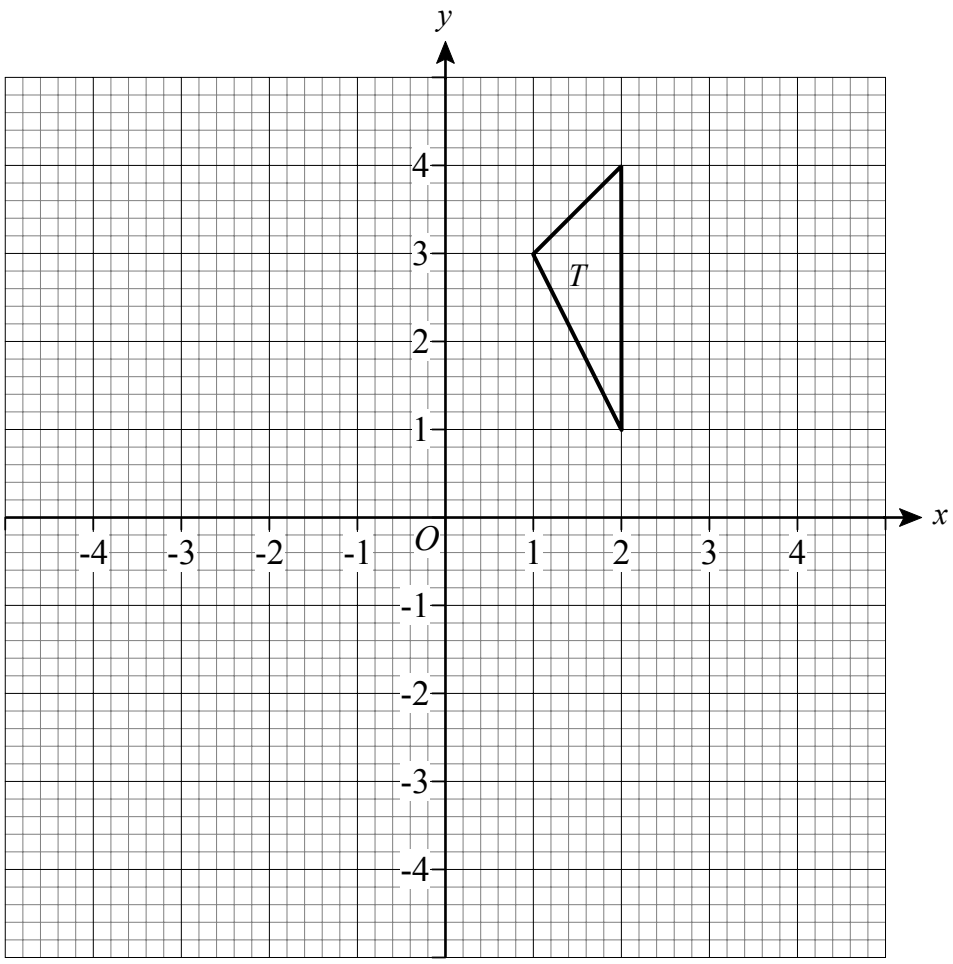
.....

.....

Answer ..... m *(3 marks)*

12 Triangle T is drawn on this grid.

Draw the image of triangle T after a 90° anticlockwise rotation about O.

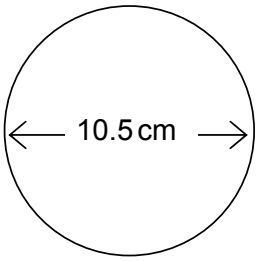


(3 marks)

Turn over for the next question

7

13 Work out the circumference of a circle of diameter 10.5 cm.



Not drawn accurately

.....

.....

.....

Answer ..... cm *(2 marks)*

14 The speed limit through some roadworks is 50 mph.

Cameras recorded the time taken for a car to travel 600 m through the roadworks as 27 seconds.

10 mph is approximately 4.47 m/s

Was the car speeding through the roadworks?

You **must** show your working.

.....

.....

.....

.....

.....

.....

.....

.....

(4 marks)

15 (a) An isosceles triangle has one angle of 80°.

Write down the possible sizes of the other two angles.

.....

.....

.....

.....

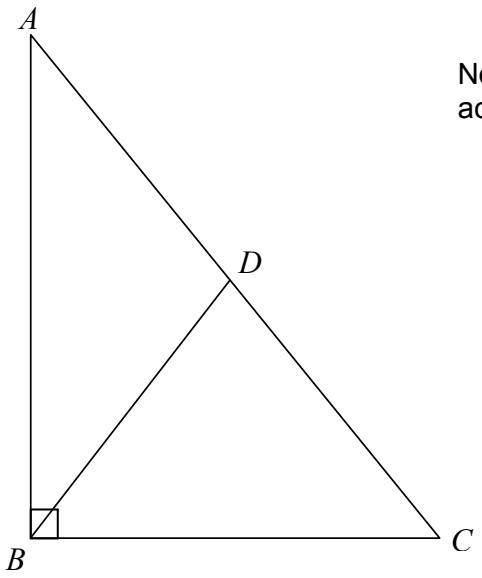
.....

Answer ..... and ..... degrees

or ..... and ..... degrees *(2 marks)*

15 (b) Triangle ABC is a right-angled triangle.

BDC is an equilateral triangle.



Not drawn accurately

Show that triangle ABD is an isosceles triangle.

.....

.....

.....

.....

.....

(3 marks)

11

16 At a wedding reception there are 103 people at 12 tables.
There are eight or nine people at each table

How many tables are there with eight people?

.....

.....

.....

.....

.....

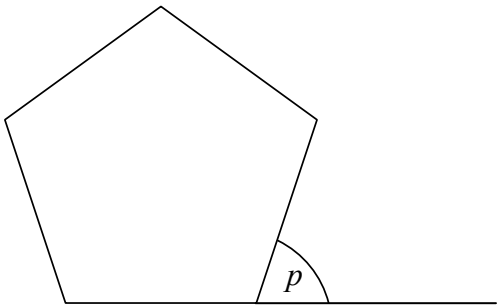
.....

.....

.....

Answer ..... *(4 marks)*

17 (a) Explain why the exterior angle of a regular pentagon, marked p on the diagram, is 72°.

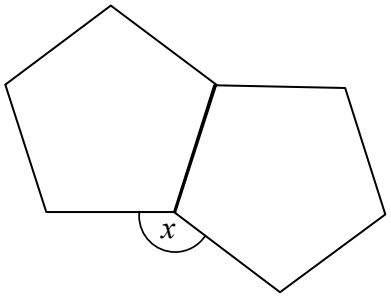


.....

.....

(1 mark)

17 (b) Two identical regular pentagons are joined as shown.



Not drawn accurately

Work out the size of angle x.

.....

.....

.....

.....

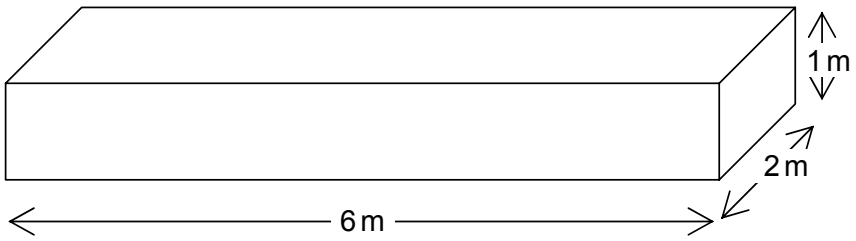
Answer ..... degrees *(2 marks)*

Turn over for the next question

7

✶**18** The shape of a flower bed is a cuboid as shown.

Not drawn accurately



$1\,m^3$ of soil weighs 1.25 tonnes

A gardener wants to fill the flower bed with soil as cheaply as possible.

The table shows the costs for Company A and Company B.

Company A	£49.50 per tonne	Delivery £30
Company B	10 tonnes for £430 then £67.50 per extra tonne	Delivery free

Which company should she use and how much will it cost?

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Answer Company .....

£ ..... *(6 marks)*

END OF QUESTIONS