

Please write clearly in block capitals.

Centre number

--	--	--	--	--

Candidate number

--	--	--	--

Surname

---

Forename(s)

---

Candidate signature

---

# GCSE METHODS IN MATHEMATICS (LINKED PAIR)

# F

Foundation Tier    Unit 2    Geometry and Algebra

---

Tuesday 10 November 2015

Morning

Time allowed: 1 hour 30 minutes

## Materials

For this paper you must have:

- a calculator
- mathematical instruments.



## Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces 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 you do not want to be marked.
- If your calculator does not have a  $\pi$  button, take the value of  $\pi$  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 16, 23 and 25. 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 book.
- You are expected to use a calculator where appropriate.

## Advice

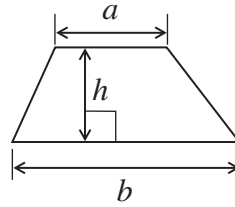
- In all calculations, show clearly how you work out your answer.



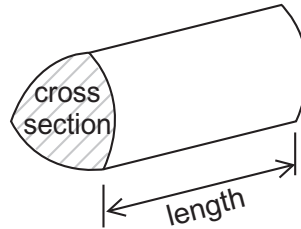
N 0 V 1 5 9 3 6 5 2 F 0 1

**Formulae Sheet: Foundation Tier**

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



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



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

**1 (a)** Write the number 155 correct to the nearest 10 **[1 mark]**

Answer .....

**1 (b)** Write the number 7369 correct to the nearest 100 **[1 mark]**

Answer .....

**2 (a)** Write down the next term in this sequence. **[1 mark]**

4.5                      8                      11.5                      15                      18.5

.....

Answer .....

**2 (b)** Describe the rule for continuing the sequence. **[1 mark]**

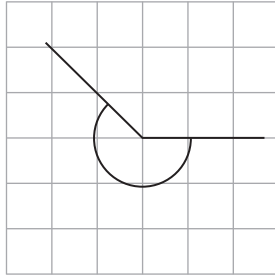
.....

.....



**3 (a)** Circle the word that describes the angle.

[1 mark]



Acute

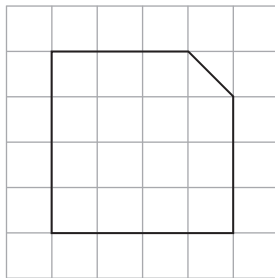
Obtuse

Reflex

Right

**3 (b)** Circle the word that describes the shape.

[1 mark]



Quadrilateral

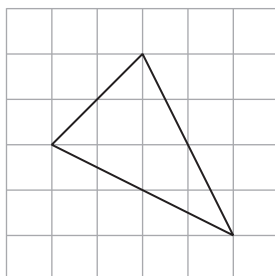
Pentagon

Hexagon

Trapezium

**3 (c)** Circle the word that describes the triangle.

[1 mark]



Equilateral

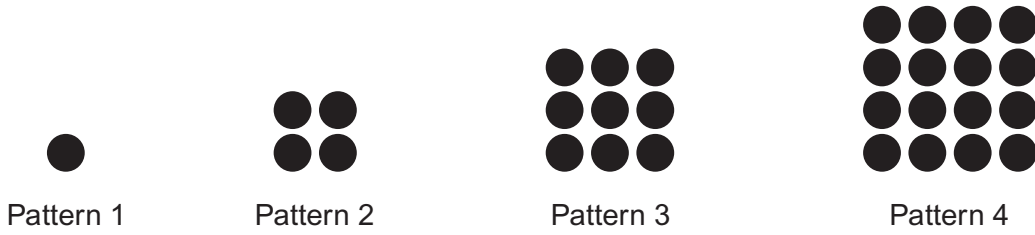
Isosceles

Right-angled

Scalene



4 (a) Counters are used to make patterns.



Fill in the two missing values in the table below.

[2 marks]

<b>Pattern number</b>	1	2	3	4	9	.....
<b>Number of counters</b>	1	4	9	16	.....	144

4 (b) Here are the first four lines of a number pattern.

Write down the **seventh** line.

[2 marks]

$$1 = 1$$

$$1 + 3 = 4$$

$$1 + 3 + 5 = 9$$

$$1 + 3 + 5 + 7 = 16$$

Answer ..... = .....

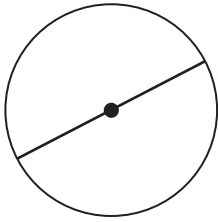
Turn over for the next question



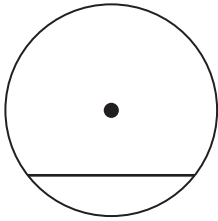
5

Match the diagrams and the words.  
The first has been done for you.

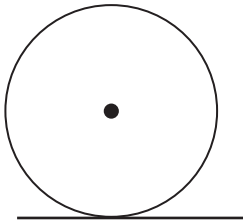
[3 marks]



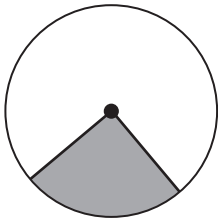
Chord



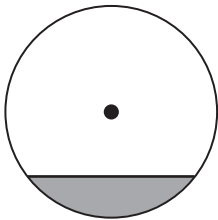
Diameter



Sector



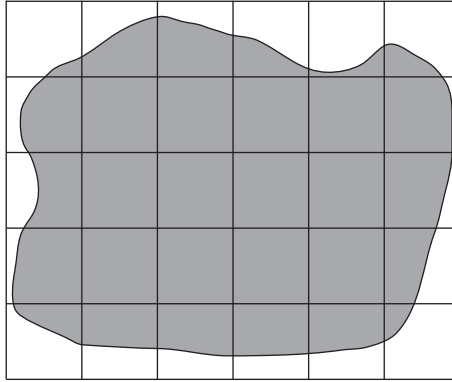
Segment



Tangent



6 Here is a shape drawn on a centimetre grid.



Estimate the area of the shape.

[2 marks]

.....

.....

.....

Answer ..... cm<sup>2</sup>

Turn over for the next question



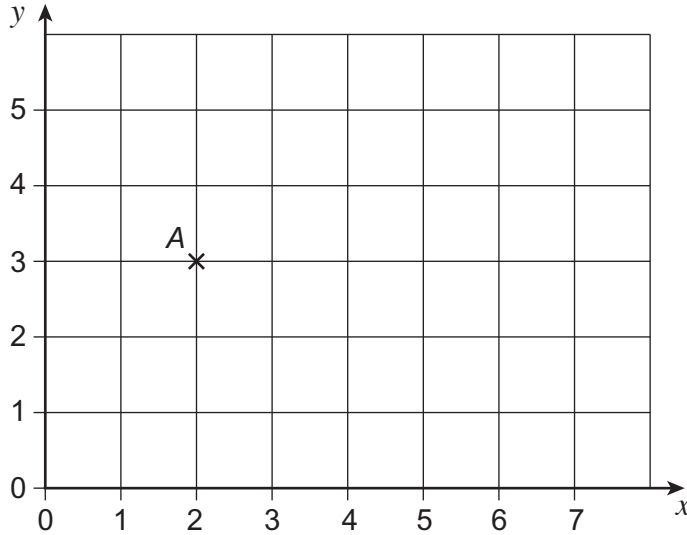
7 Two-thirds of a number is 44  
What is one-half of the number?

[2 marks]

.....  
.....  
.....

Answer .....

8 Point A is drawn on the grid below.



The midpoint of the line AB is M (4, 2)

Work out the coordinates of B.

[2 marks]

.....  
.....  
.....

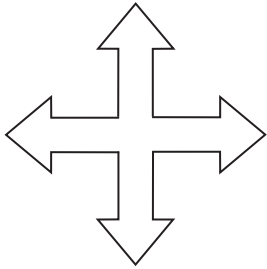
Answer ( ..... , ..... )





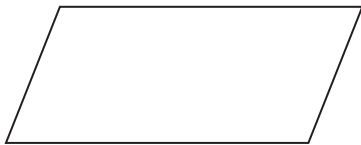
9 For each shape write down,  
the number of lines of symmetry  
the order of rotational symmetry.

[3 marks]



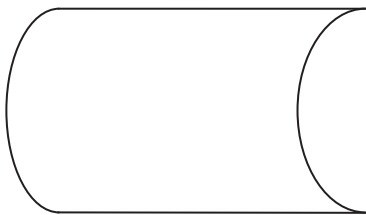
Number of lines of symmetry .....

Order of rotational symmetry .....



Number of lines of symmetry .....

Order of rotational symmetry .....



Number of lines of symmetry .....

Order of rotational symmetry .....



10 Three numbers add up to 35

The two smallest numbers are the same.

The difference between the largest and smallest numbers is 8

Work out the three numbers.

[2 marks]

.....

.....

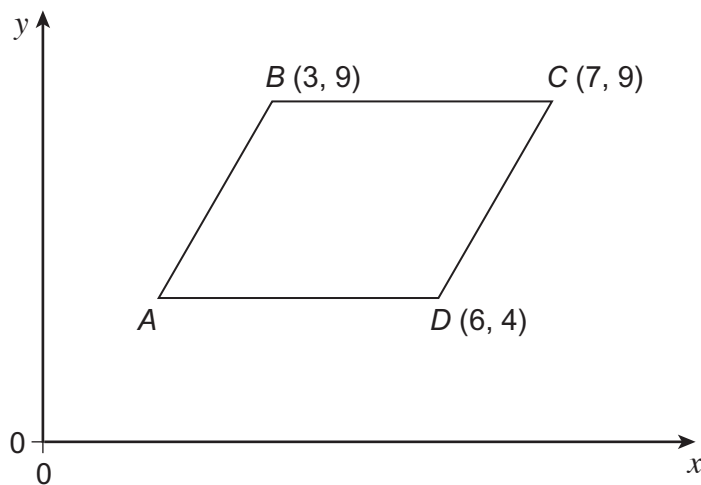
.....

.....

.....

Answer ..... and ..... and .....

11  $ABCD$  is a parallelogram.



Not drawn  
accurately

Work out the coordinates of A.

[2 marks]

Answer ( ..... , ..... )



12 Use your calculator to work out the following.

12 (a)  $\sqrt{12.96}$

[1 mark]

Answer .....

12 (b)  $\frac{3.2^2}{4}$

[1 mark]

Answer .....

12 (c)  $(4.9 + 8.5) \times 16$

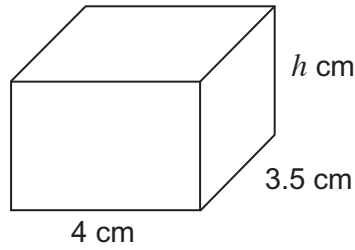
[1 mark]

Answer .....

Turn over for the next question



13 A cuboid has length 4 cm, width 3.5 cm and height  $h$  cm



The volume of the cuboid is  $21 \text{ cm}^3$   
Work out the value of  $h$ .

[2 marks]

.....

.....

Answer ..... cm

14 Here are six angles.

- 30°      40°      50°      80°      90°      130°

A seventh angle is added to the list.  
The seven angles are used to make a triangle and a quadrilateral.

Work out the seventh angle.

[3 marks]

.....

.....

.....

.....

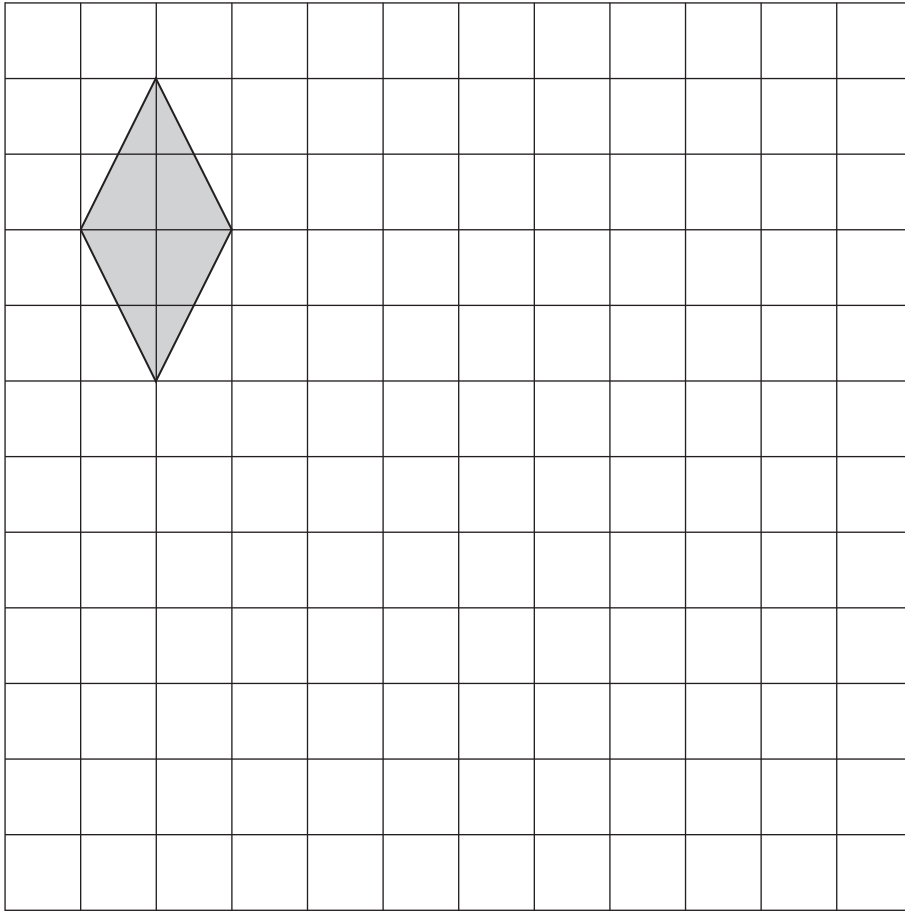
.....

Answer ..... degrees



15 (a) Enlarge this shape by scale factor 2

[2 marks]



15 (b) The area of the original shape is  $4 \text{ cm}^2$   
Work out the area of the enlarged shape.

[2 marks]

.....

.....

Answer .....  $\text{cm}^2$



**\*16** Work out the following calculations.  
Arrange the answers in order of size, starting with the smallest.

**[5 marks]**

$$\frac{4}{5} \text{ of } 68$$

$$0.7 \times 78$$

$$62\% \text{ of } 88$$

.....

.....

.....

.....

.....

.....

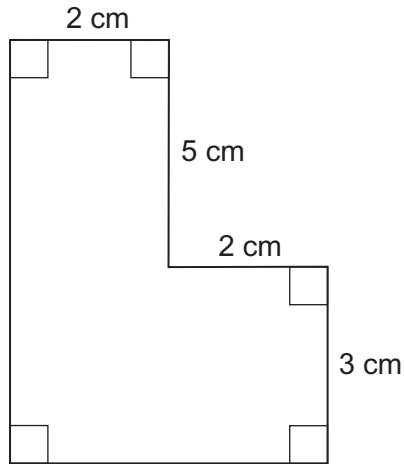
.....

.....

Answer ....., ....., .....



17 Here is a shape.



Not drawn  
accurately

17 (a) Work out the area of the shape.

[2 marks]

.....

.....

.....

.....

.....

Answer ..... cm<sup>2</sup>

17 (b) Work out the perimeter of the shape.

[1 mark]

.....

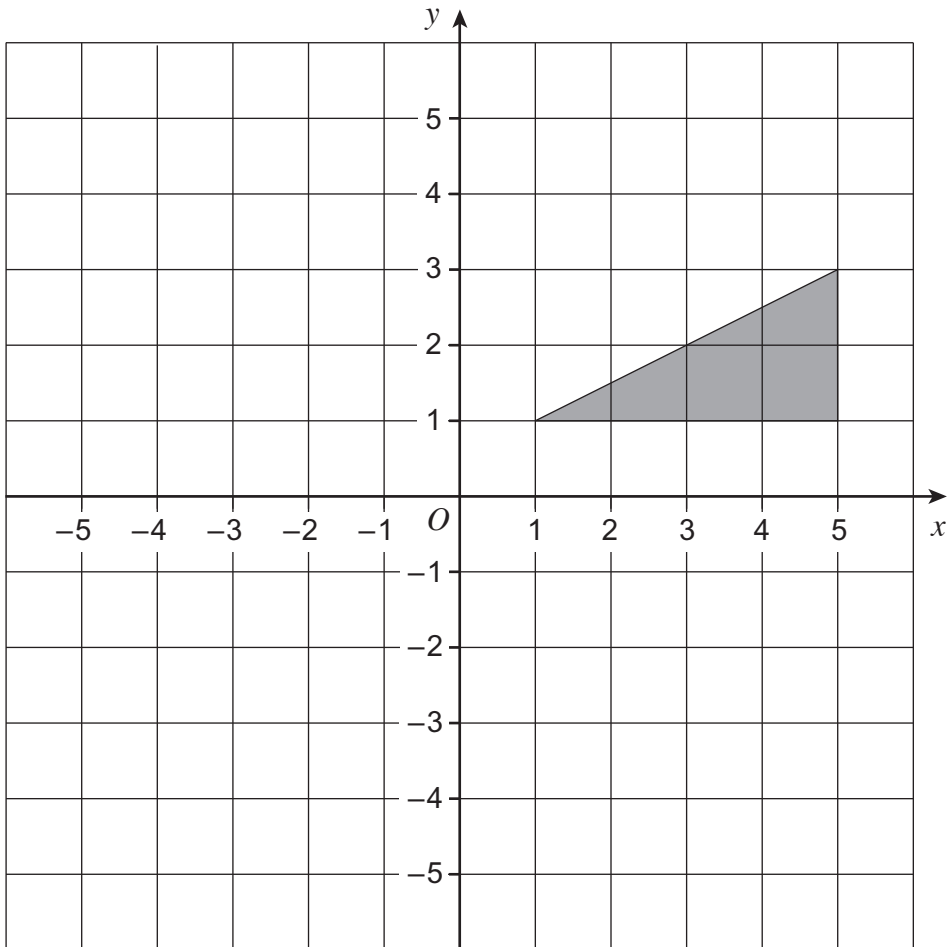
.....

Answer ..... cm



18 (a) Reflect the triangle in the line  $y = 0$

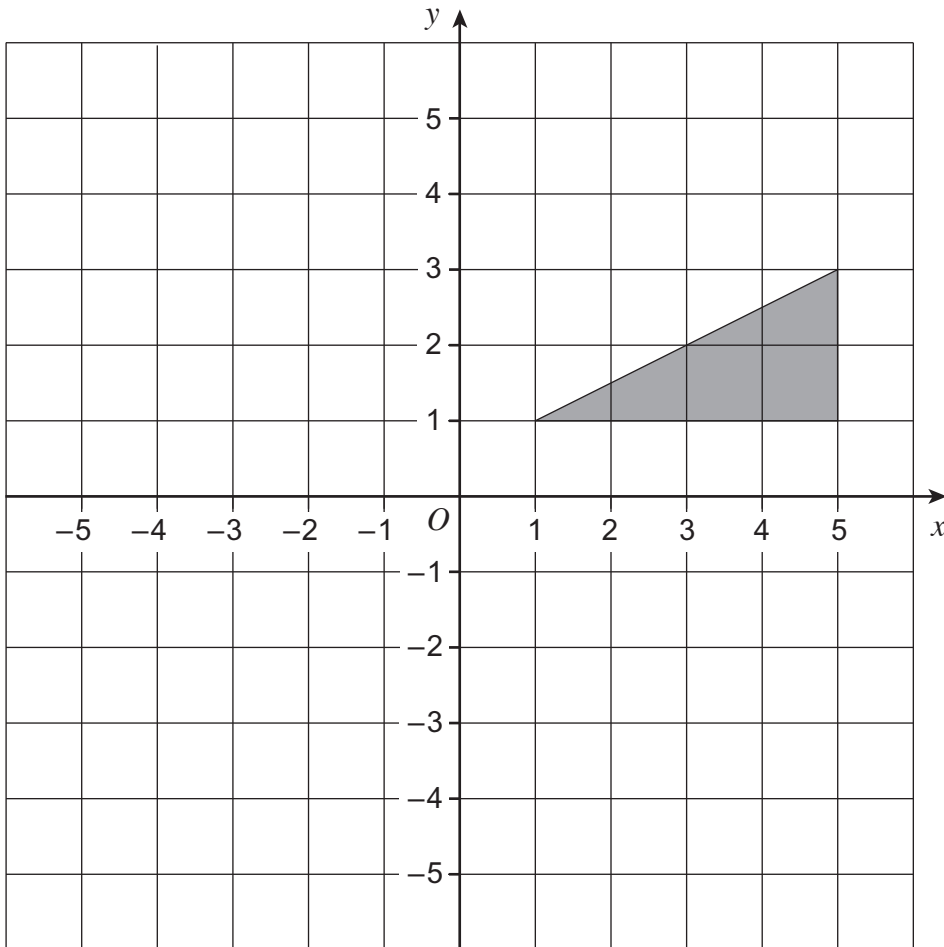
[2 marks]





18 (b) Rotate the triangle through  $180^\circ$  about the origin.

[2 marks]



Turn over for the next question

Turn over ►



**19 (a)** Circle the number that is the square of a prime number.

**[1 mark]**

16

36

81

121

225

**19 (b)** Jim subtracts a **single-digit** prime number from a **two-digit** prime number.  
The result is a square number.

Work out two possible prime numbers Jim could have used.

**[2 marks]**

.....

.....

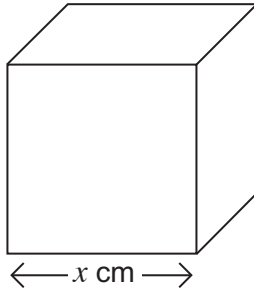
.....

.....

Answer ..... and .....



20



This is how to work out the surface area of a cube with an edge of length  $x$  cm

Step 1      Square  $x$

Step 2      Multiply by 6

Work out the **volume** of a cube with a surface area of  $121.5 \text{ cm}^2$

**[3 marks]**

.....

.....

.....

.....

.....

Answer .....  $\text{cm}^3$

**Turn over for the next question**

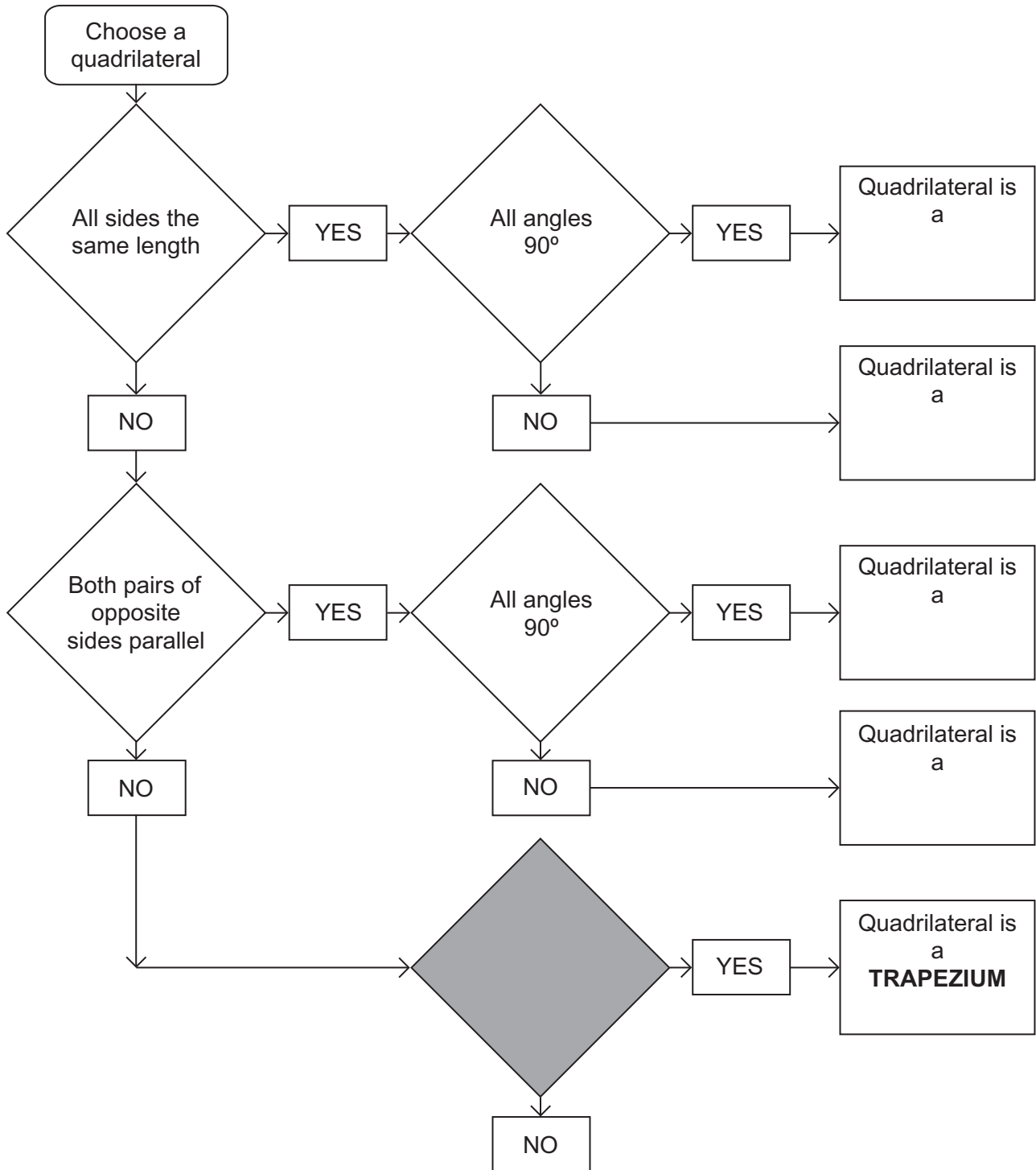


**21 (a)** The diagram below is used to sort some quadrilaterals.  
A trapezium has already been sorted.

Use the diagram to sort

a parallelogram, a rectangle, a rhombus and a square.

**[2 marks]**



**21 (b)** A trapezium has been sorted in the diagram on the opposite page.

Write a statement, using the properties of quadrilaterals, that could go into the shaded box.

**[1 mark]**

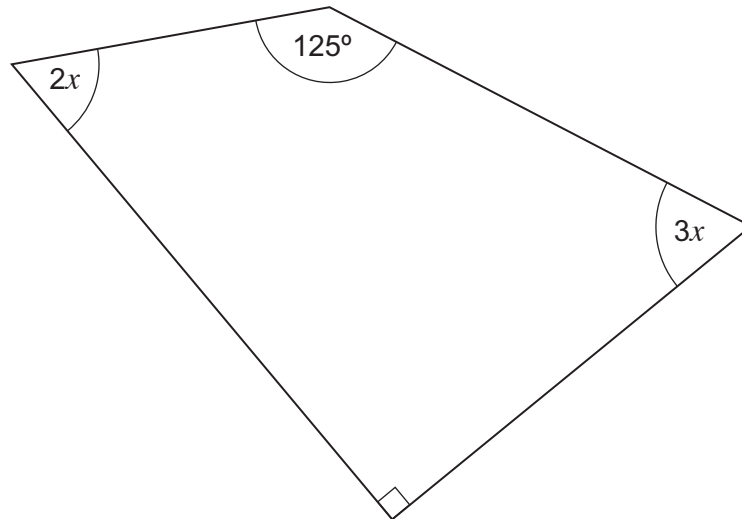
.....

.....

.....

**22** Work out the value of  $x$ .

**[4 marks]**



Not drawn accurately

.....

.....

.....

.....

.....

Answer ..... degrees

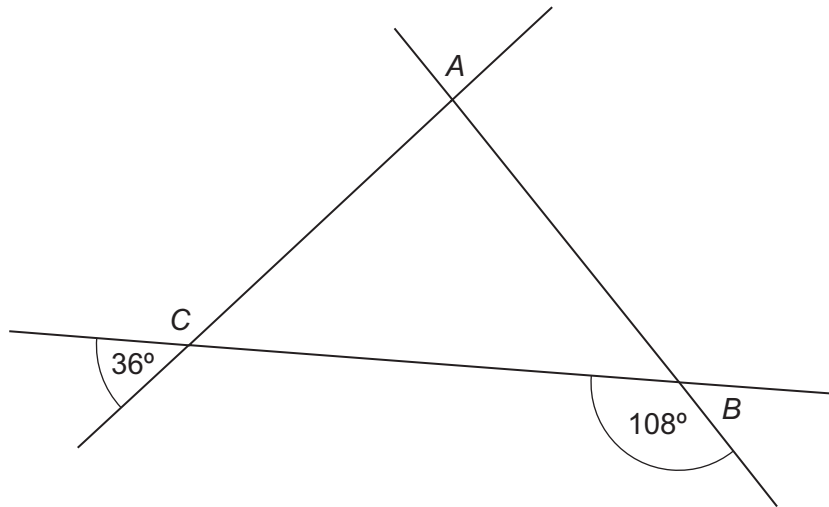
7

Turn over ►



**\*23**

Three straight lines cross as shown.

Not drawn  
accuratelyShow that triangle  $ABC$  is isosceles.**[4 marks]**

.....

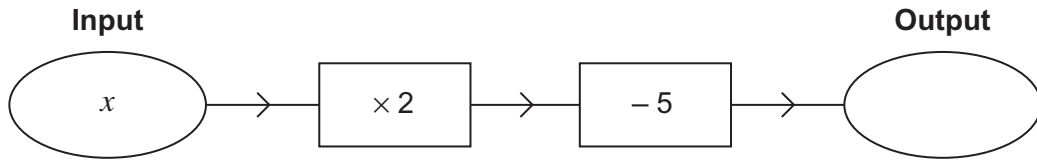
.....

.....

.....



24 Here is a number machine.



The output is four times the input.

Use algebra to work out the value of  $x$ .

You **must** show your working.

[4 marks]

.....

.....

.....

.....

.....

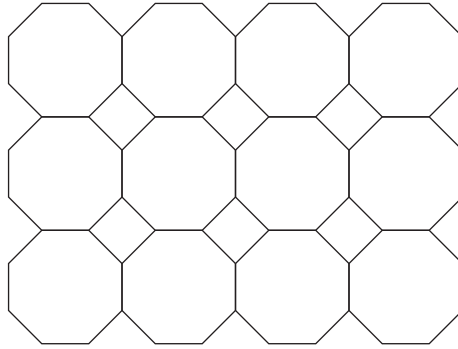
$x =$  .....

Turn over for the next question



**\*25**

The diagram shows a tessellation made from regular octagons and squares.



Give working to show why these regular octagons and squares will tessellate.  
You may use a diagram to help you show your answer.

**[3 marks]**

.....

.....

.....

.....

.....

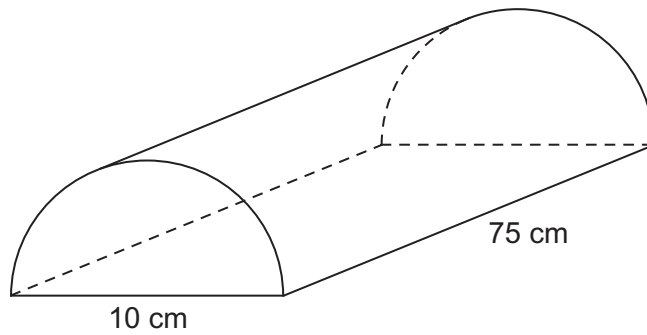
.....





26

A prism has a semicircular cross section with a diameter of 10 centimetres.  
The prism is 75 centimetres long.



Work out the volume of the prism.  
State the units of your answer.

[5 marks]

.....

.....

.....

.....

.....

.....

.....

.....

Answer .....

**END OF QUESTIONS**



**There are no questions printed on this page**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**



**There are no questions printed on this page**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**



**There are no questions printed on this page**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**

**Copyright Information**

For confidentiality purposes, from the November 2015 examination series, acknowledgements of third party copyright material will be published in a separate booklet rather than including them on the examination paper or support materials. This booklet is published after each examination series and is available for free download from [www.aqa.org.uk](http://www.aqa.org.uk) after the live examination series.

Permission to reproduce all copyright material has been applied for. In some cases, efforts to contact copyright-holders may have been unsuccessful and AQA will be happy to rectify any omissions of acknowledgements. If you have any queries please contact the Copyright Team, AQA, Stag Hill House, Guildford, GU2 7XJ.

Copyright © 2015 AQA and its licensors. All rights reserved.

