

Name

Class



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# Angles in polygons

(9 – 1) Topic booklet

## HIGHER

These questions have been collated from previous years GCSE Mathematics papers.

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- If the question is a **1F** question you are not allowed to use a calculator.
- If the question is a **2F** or a **3F** question, you may use a calculator to help you answer.

### Information

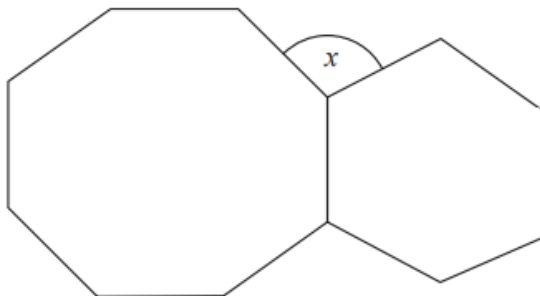
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

**Answer ALL questions**  
**Write your answers in the space provided.**  
**You must write down all the stages in your working.**

**4**



The diagram shows a regular octagon and a regular hexagon.

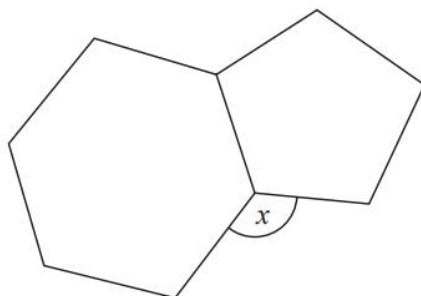
Find the size of the angle marked  $x$   
You must show all your working.

$x = \dots\dots\dots^\circ$

Specimen 2 – Paper 2H

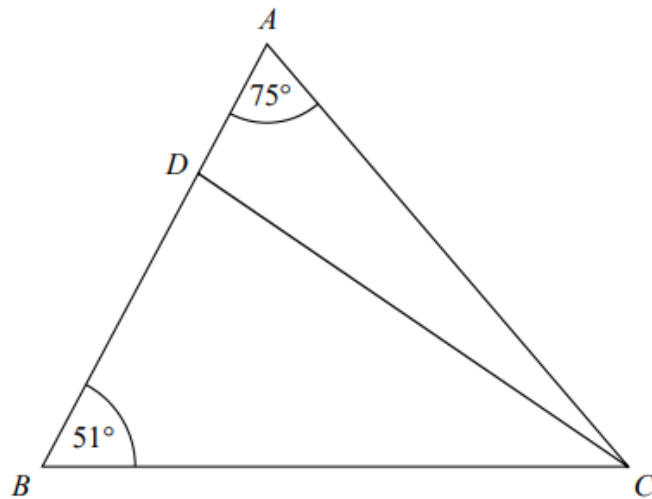
**(Total for Question 4 is 3 marks)**

5 Here is a regular hexagon and a regular pentagon.



Work out the size of the angle marked  $x$ .  
You must show all your working.

5 The diagram shows triangle  $ABC$ .

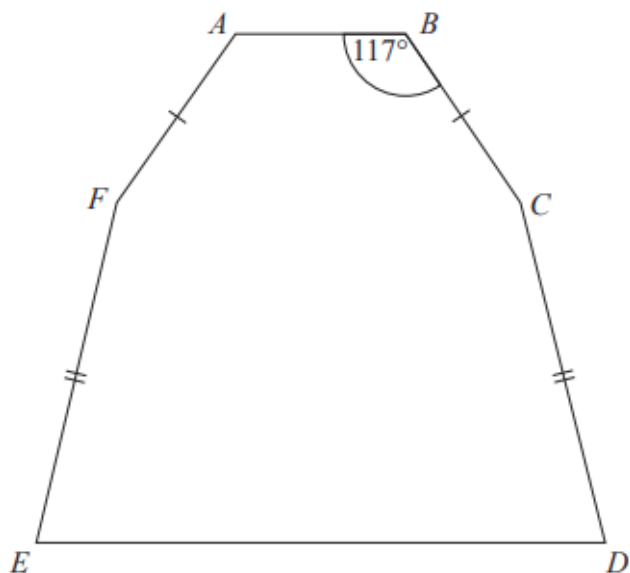


$ADB$  is a straight line.

the size of angle  $DCB$  : the size of angle  $ACD = 2 : 1$

Work out the size of angle  $BDC$ .

- 5 The diagram shows a hexagon.  
The hexagon has one line of symmetry.



$$FA = BC$$

$$EF = CD$$

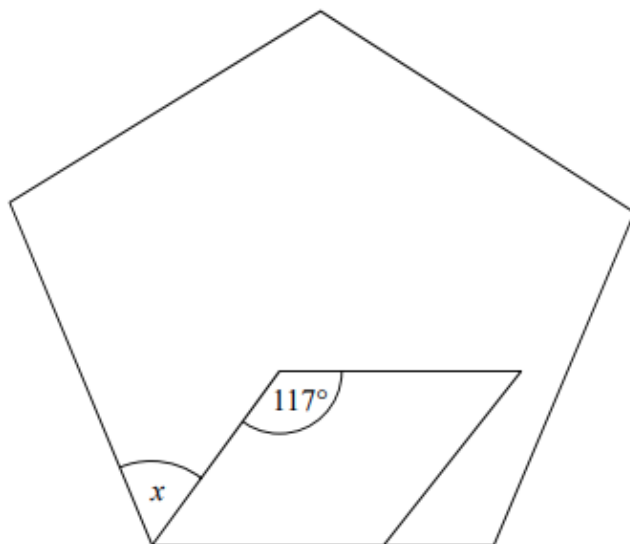
$$\text{Angle } ABC = 117^\circ$$

$$\text{Angle } BCD = 2 \times \text{angle } CDE$$

Work out the size of angle  $AFE$ .

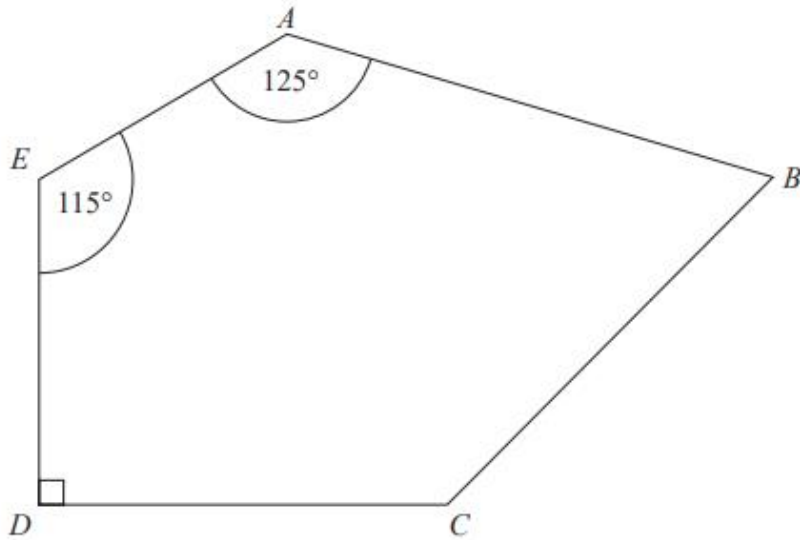
You must show all your working.

8 The diagram shows a regular pentagon and a parallelogram.



Work out the size of the angle marked  $x$ .  
You must show all your working.

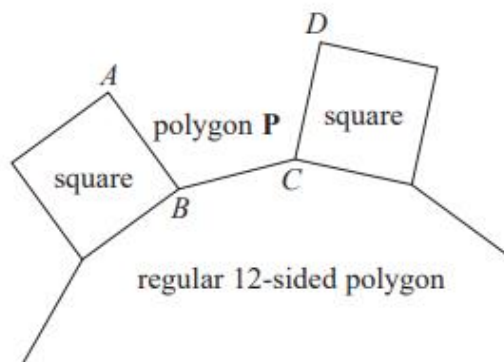
8  $ABCDE$  is a pentagon.



Angle  $BCD = 2 \times$  angle  $ABC$

Work out the size of angle  $BCD$ .  
You must show all your working.

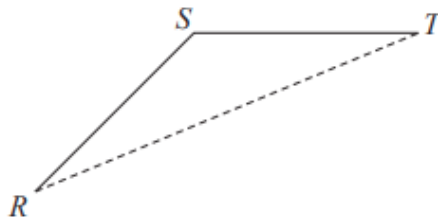
5 In the diagram,  $AB$ ,  $BC$  and  $CD$  are three sides of a regular polygon  $P$ .



Show that polygon  $P$  is a hexagon.  
You must show your working.



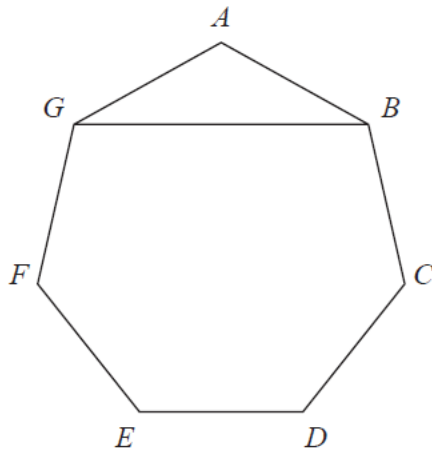
12



$RS$  and  $ST$  are 2 sides of a regular 12-sided polygon.  
 $RT$  is a diagonal of the polygon.

Work out the size of angle  $STR$ .  
You must show your working.

26  $ABCDEFG$  is a regular heptagon.



The area of triangle  $ABG$  is  $30 \text{ cm}^2$

Calculate the length of  $GB$ .

Give your answer correct to 3 significant figures.

You must show all your working.

..... cm