



## Foundation / Higher Tier

# Angles in Polygons

### 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.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a  $\pi$  button, take the value of  $\pi$  to be 3.142 unless the question instructs otherwise.

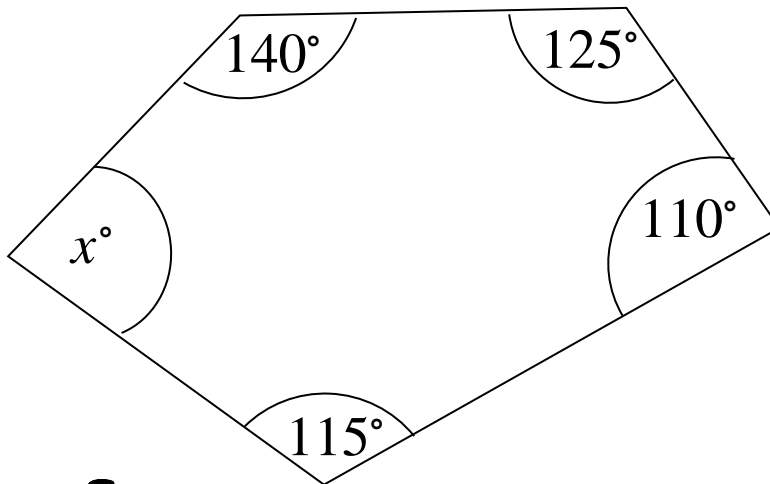
### Information

- 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.

1. Calculate the size of the angle marked  $x$ .



$$(5-2) \times 180 = 540$$

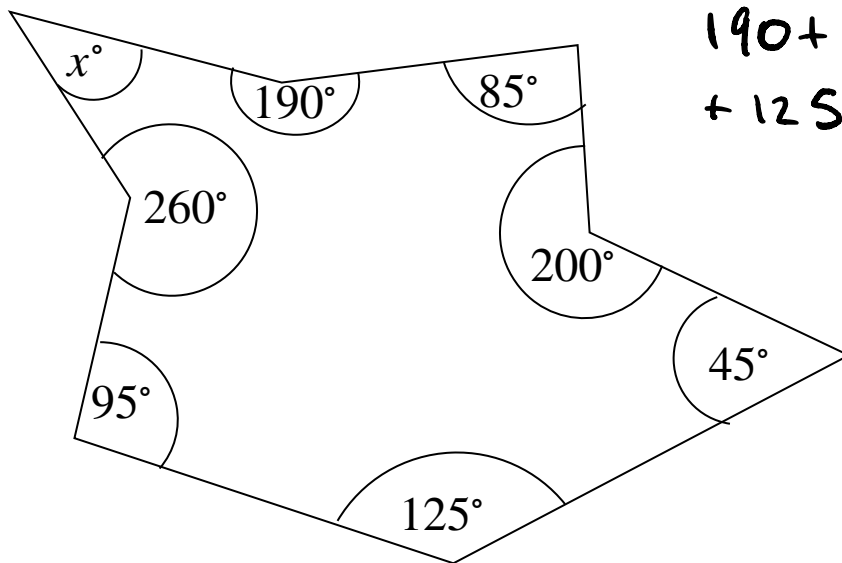
$$140 + 125 + 110 + 115 = 490$$

$$540 - 490 = 50$$

50°

(Total for Question 1 is 3 marks)

2. Calculate the size of the angle marked  $x$ .



$$(8-2) \times 180 = 1080$$

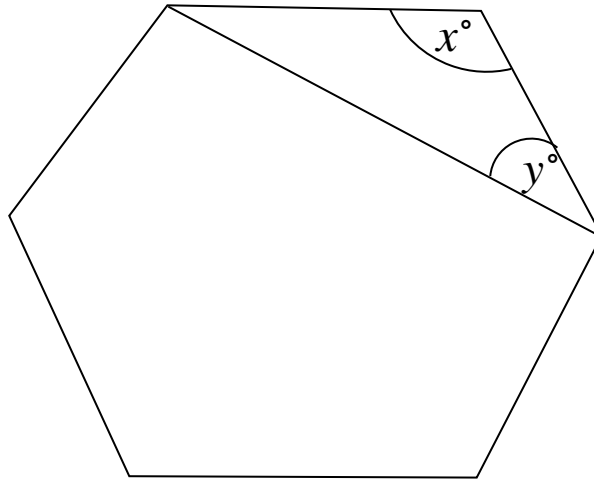
$$190 + 85 + 200 + 45 + 125 + 95 + 260 = 1000$$

$$x = 1080 - 1000 = 80$$

80°

(Total for Question 2 is 3 marks)

3. Below is a regular hexagon.



(a) Work out the size of the angle marked  $x^\circ$

$$(6-2) \times 180 = 720$$

$$720 \div 6 = 120$$

120°

.....  
(2)

(b) Work out the size of the angle marked  $y^\circ$

$$180 - 120 = 60$$

$$60 \div 2 = 30$$

30°

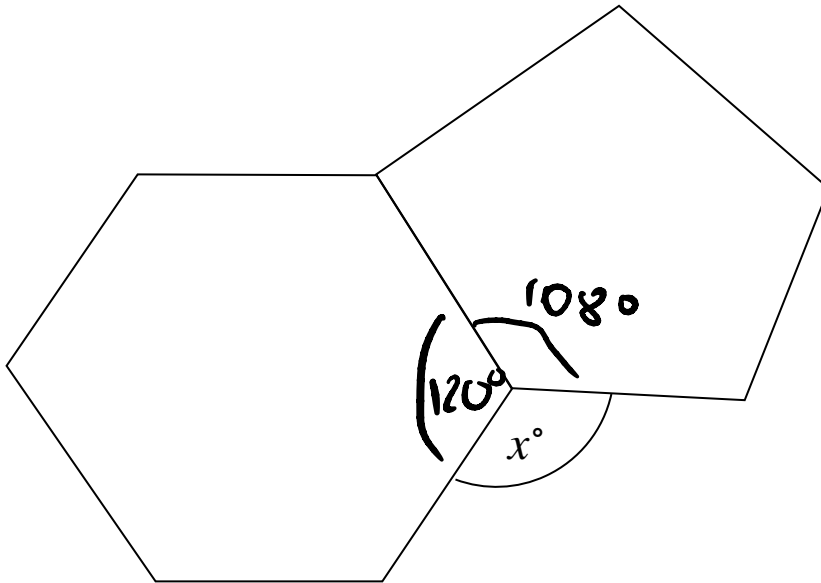
.....  
(2)

(Total for Question 3 is 4 marks)

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4. Below is a regular hexagon and a regular pentagon.

$$\begin{array}{r} (6-2) \times 180 \\ \hline 6 \\ = 720 \\ \hline 6 \\ = 120 \end{array}$$



$$\begin{array}{r} (5-2) \times 180 \\ \hline 5 \\ = 540 \div 5 \\ = 108^\circ \end{array}$$

Work out the size of the angle marked  $x^\circ$

$$360 - 108 - 120 = 132^\circ$$

132<sup>°</sup>

.....  
(Total for Question 4 is 4 marks)

5. A regular polygon has 15 sides.  
Work out the size of each interior angle.

$$\begin{array}{r} (15-2) \times 180 = 156^\circ \\ \hline 15 \end{array}$$

156<sup>°</sup>

.....  
(Total for Question 5 is 3 marks)

6. Here is a hexagon ABCDEF.  
 Angle ABD = 2 x angle DEF  
 Find the size of angle DEF

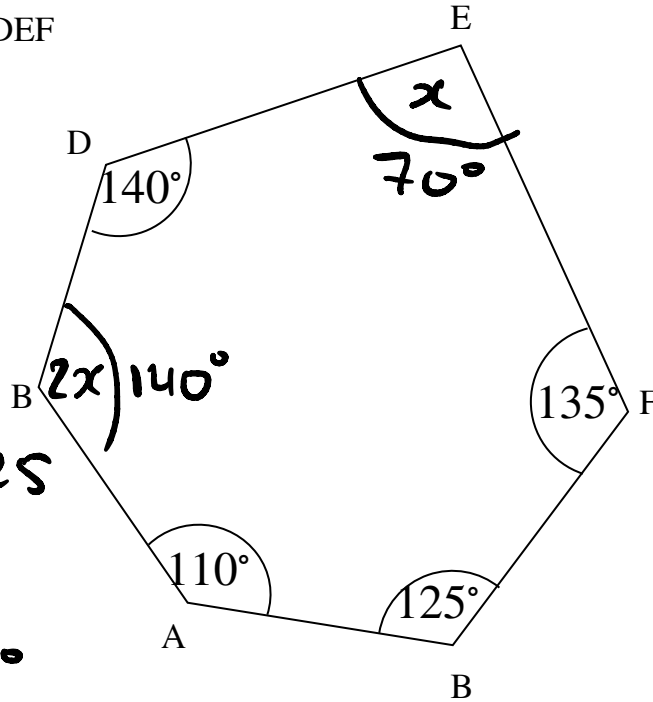


Diagram not drawn accurately

$$(6-2) \times 180 = 720^\circ$$

$$140 + 135 + 110 + 125 = 510^\circ$$

$$720 - 510 = 210^\circ$$

$$210 \div 3 = 70$$

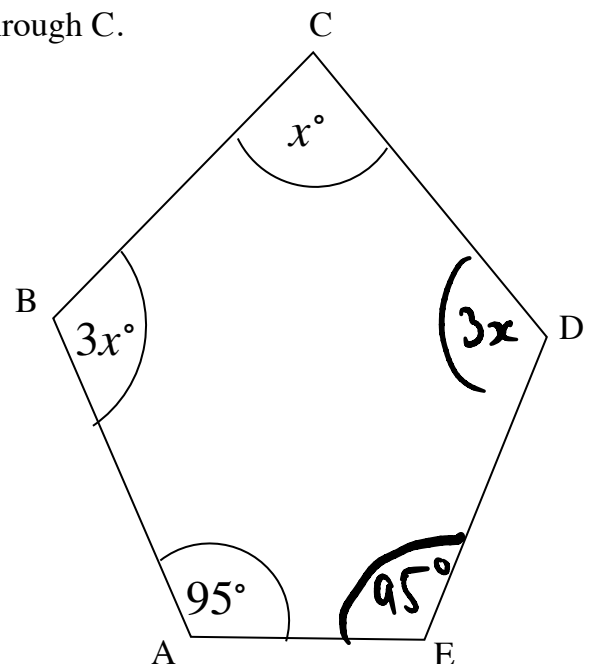
70°

(Total for Question 6 is 4 marks)

7. Below is a pentagon ABCDE with a line of symmetry through C.

Find the size of angle BCD.

Diagram not drawn accurately



$$x + 3x + 3x + 95 + 95 = 540$$

$$7x + 190 = 540$$

$$7x = 350$$

$$x = 50$$

50°

(Total for Question 7 is 4 marks)

8. Each exterior angle of a regular polygon is  $24^\circ$ .  
Work out how many sides the polygon has.

$$360 \div 24 = 15$$

15

.....  
(Total for Question 8 is 2 marks)

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9. Each interior angle of a regular polygon is  $150^\circ$ .  
Work out how many sides the polygon has.

$$180 - 150 = 30$$

$$360 \div 30 = 12$$

12

.....  
(Total for Question 9 is 2 marks)

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10. A regular polygon has 18 sides.  
Work out the size of each exterior angle.

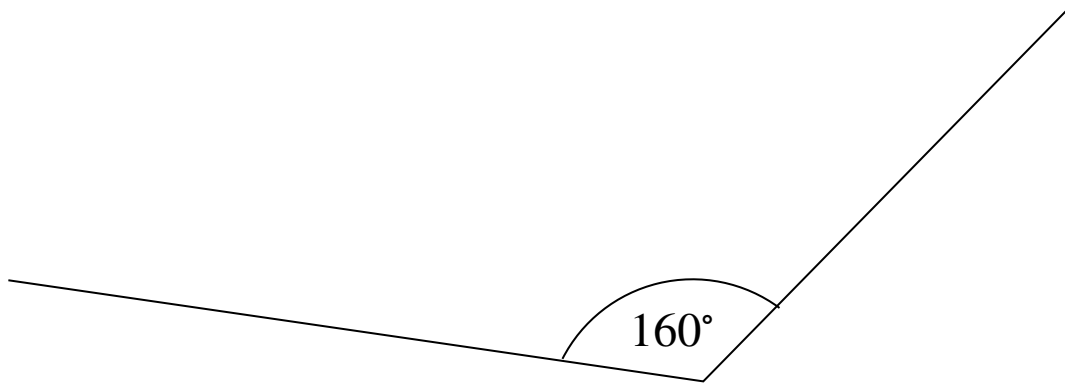
$$360 \div 18 = 20$$

20<sup>°</sup>

.....  
(Total for Question 10 is 2 marks)

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11. Shown is an interior angle from a regular polygon.



Calculate the number of sides the polygon has.

$$180 - 160 = 20$$

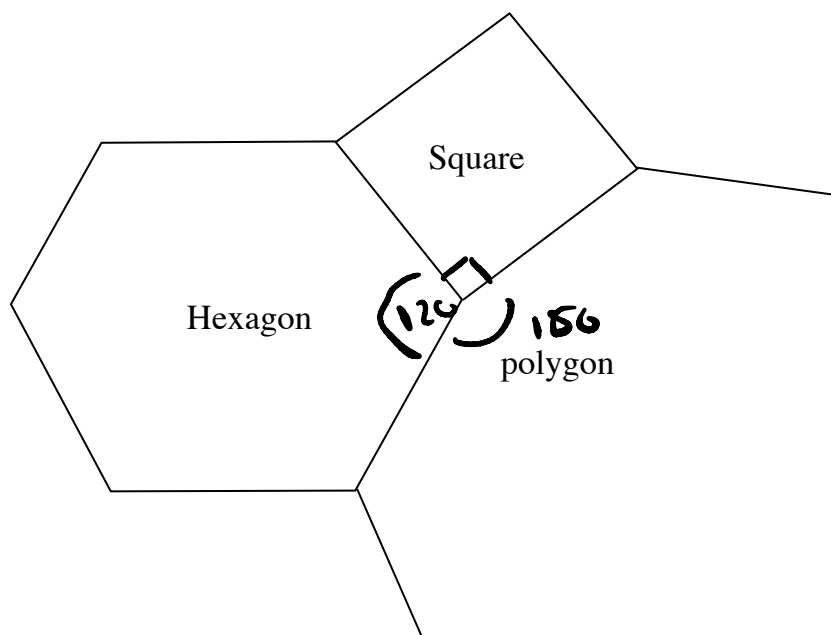
$$360 \div 20 = 18$$

18

(Total for Question 11 is 2 marks)

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12. Shown below is part of a regular polygon, a regular hexagon and a square meeting at a point.



$$\begin{aligned} & \frac{(6-2) \times 180}{6} \\ & = 720 \div 6 \\ & = 120 \end{aligned}$$

Work out how many sides the regular polygon has.

$$360 - 120 - 90 = 150$$

$$180 - 150 = 30$$

$$360 \div 30 = 12$$

12

(Total for Question 12 is 4 marks)

13. The exterior angle of a regular polygon is three times smaller than the exterior angle of a regular hexagon. Work out how many sides the polygon has.



$$4x = 180$$

$$x = 45$$

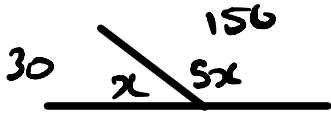
$$360 \div 45 = 8$$

8

(Total for Question 13 is 4 marks)

14. The interior angle of a regular polygon is 5 times its exterior angle.

Work out how many sides the polygon has.



$$6x = 180$$

$$x = 30$$

$$360 \div 30 = 12$$

12

.....  
(Total for Question 14 is 4 marks)

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