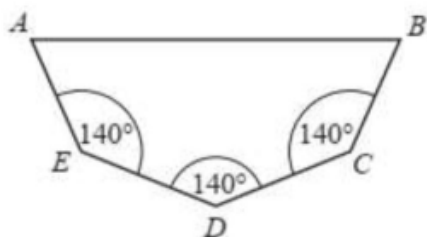




1. Find the sum of the interior angles of a 25-sided polygon. [2]

0580/23/O/N/15 Q8)

2. The pentagon has three angles which are each  $140^\circ$ .



The other two interior angles are equal.

Calculate the size of one of these angles. [3]

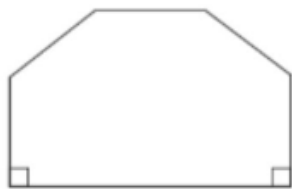
0580/22/O/N/10 Q10)

3. Five angles of a hexagon are each  $115^\circ$ .

Calculate the size of the sixth angle. [3]

0580/21/M/J/16 Q17)

4. The front of a house is in the shape of a hexagon with two right angles.



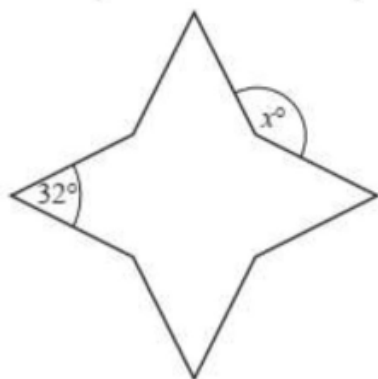
The other four angles are all the same size.

Calculate the size of one of these angles. [3]

0580/21/O/N/11 Q6)



5. The diagram shows an octagon.



All of the sides are the same length.

Four of the interior angles are each  $32^\circ$ .

The other four interior angles are equal.

Find the value of  $x$  [4].

**0580/41/O/N/17 Q2(a)**

6. A regular polygon has an interior angle of  $176^\circ$ .

Find the number of sides of this polygon. [3]

**0580/22/O/N/19 Q12)**

7. A regular polygon has an interior angle of  $172^\circ$ .

Find the number of sides of this polygon. [3]

**0580/22/M/J/16 Q9)**

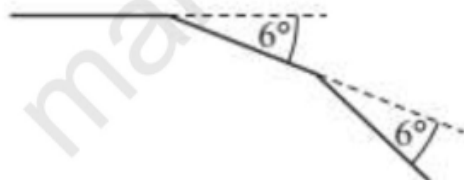


8. A regular polygon has an exterior angle of  $40^\circ$ .  
Work out the number of sides of this polygon. [2]  
**0580/23/O/N/16 Q15(b)**

9. The exterior angle of a regular polygon is  $24^\circ$ .  
Find the number of sides of this regular polygon. [2]  
**0580/22/F/M/15 Q8(b)**

10. The exterior angle of a regular polygon is  $36^\circ$ .  
What is the name of this polygon? [3]  
**0580/22/O/N/13 Q9)**

11. The diagram shows two of the exterior angles of a regular polygon with  $n$  sides.



Calculate  $n$ . [2]  
**0580/22/O/N/12 Q4)**



12. A regular polygon has  $n$  sides. Each exterior angle is  $5n/2$  degrees. Find the value of  $n$ . [3]

**0580/43/O/N/11 Q3(b)**

13. In a regular polygon, the interior angle and the exterior angle are in the ratio interior : exterior = 11 : 1.  
Find the number of sides of this regular polygon. [3]

**0580/22/F/M/23 Q12)**

14. Calculate the size of one interior angle of a regular 12-sided polygon. [3]

**0580/23/O/N/17 Q11)**

15. Find the interior angle of a regular polygon with 18 sides.[3]

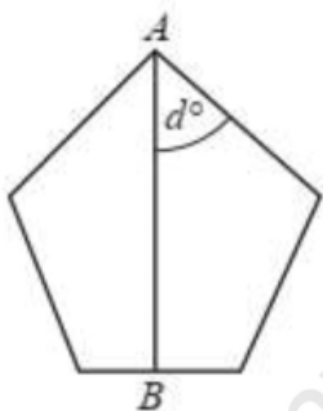
**0580/23/O/N/14 Q7)**



16. A regular polygon has 72 sides.  
Find the size of an interior angle.  
**0580/41/O/N/19 Q1(c)**

17. Show that each interior angle of a regular pentagon is  $108^\circ$ . [2]  
**0580/42/M/J/19 Q7(a)**

18. The diagram shows a regular pentagon.



AB is a line of symmetry.  
Work out the value of  $d$  [3]  
**0580/21/O/N/17 Q11)**

19. The diagram shows part of a regular polygon.



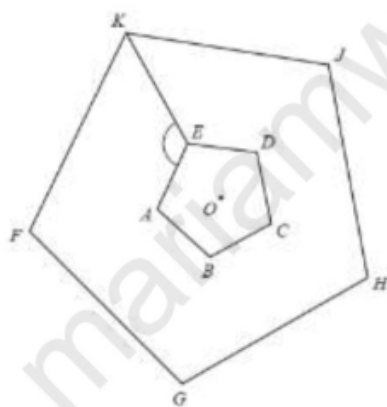
The exterior angle is  $x^\circ$ .  
The interior angle is  $29x^\circ$ .  
Work out the number of sides of this polygon. [3]  
**0580/22/O/N/17 Q17)**



20. The exterior angle of a regular polygon is  $x^\circ$   
and the interior angle is  $8x^\circ$ .  
Calculate the number of sides of the polygon. [3]  
**0580/41/M/J/18 Q8(a)**

21. In a regular polygon, the interior angle is 11 times the exterior angle.  
(i) Work out the number of sides of this polygon. [3]  
(ii) Find the sum of the interior angles of this polygon.[2]  
**0580/42/M/J/18 Q9(b)**

22. The diagram shows two regular pentagons.

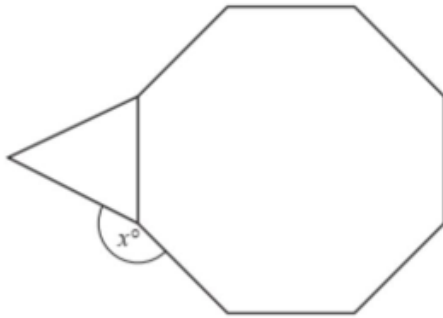


Pentagon FGHIK is an enlargement of pentagon ABCDE, centre O. Find angle AEK. [4]

**0580/23/M/J/19 Q25(a)**



23. The diagram shows a regular octagon



joined to an equilateral triangle. Work out the value of  $x$  [3].

**0580/21/M/J/17 Q14)**

24. The vertices A, B, C, D and E of a regular pentagon lie on the circumference of a circle, centre O, radius 7 cm.

They also lie on the sides of a rectangle WXYZ.

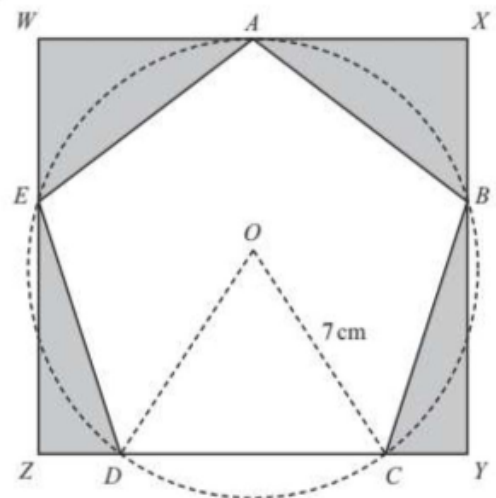
(a) Show that

(i) angle  $DOC = 72^\circ$ , [1]

(ii) angle  $DCB = 108^\circ$  [2]

(iii) angle  $CBY = 18^\circ$ . [1]

**0580/41/O/N/12 Q7)**





25. In the pentagon ABCDE, angle EAB = angle ABC =  $110^\circ$  and angle CDE =  $84^\circ$ .

Angle BCD = angle DEA =  $x^\circ$ .

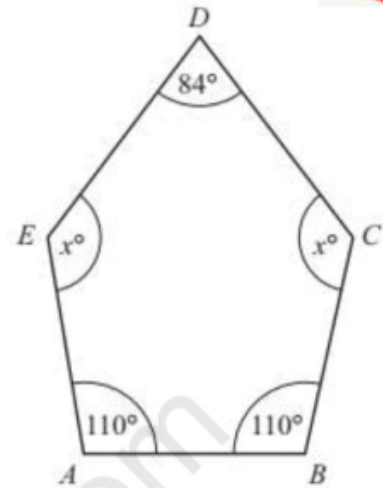
(i) Calculate the value of  $x$  [2]

(ii)  $BC = CD$ . Calculate angle CBD. [1]

(iii) This pentagon also has one line of symmetry.

Calculate angle ADB. [1]

**0580/41/M/J/13 Q8(a)**



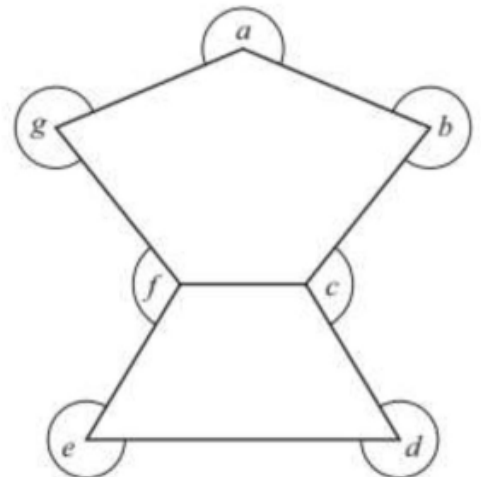
26. (a) One angle of an isosceles triangle is  $48^\circ$ .

Write down the possible pairs of values for the remaining two angles. .... and ...., .... and .... [2]

(b) Calculate the sum of the interior angles of a pentagon. [2]

(c) Calculate the sum of the angles  $a$ ,  $b$ ,  $c$ ,  $d$ ,  $e$ ,  $f$  and  $g$  shown in this diagram. [2]

**0580/43/O/N/13 Q4**



27. ABCDEF is a hexagon.

The interior angle B is  $4^\circ$  greater than interior angle A.

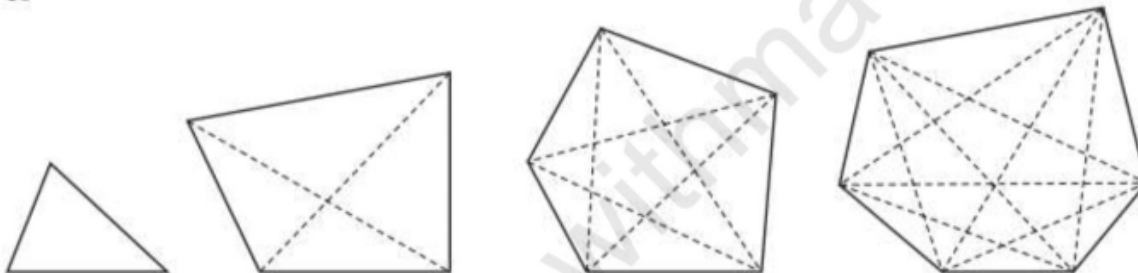
The interior angle C is  $4^\circ$  greater than interior angle B, and so on, with each of the next interior angles  $4^\circ$  greater than the previous one.

(i) By how many degrees is interior angle F greater than interior angle A? [1]

(ii) Calculate interior angle A. [3]

**0580/43/M/J/10 Q5)**

28. The diagrams show some polygons and their diagonals.



(a) Complete the table. [3]

| Number of sides | Name of polygon | Total number of diagonals |
|-----------------|-----------------|---------------------------|
| 3               | triangle        | 0                         |
| 4               | quadrilateral   | 2                         |
| 5               |                 | 5                         |
| 6               | hexagon         | 9                         |
| 7               | heptagon        | 14                        |
| 8               |                 |                           |

(b) Write down the total number of diagonals in

(i) a decagon (a 10-sided polygon), [1]



(ii) a 12-sided polygon.[1]

(c) A polygon with  $n$  sides has a total of  $\frac{1}{p}n(n - q)$

diagonals, where  $p$  and  $q$  are integers.

(i) Find the values of  $p$  and  $q$ . [3]

(ii) Find the total number of diagonals in a polygon with 100 sides. [2]

(iii) Find the number of sides of a polygon which has a total of 170 diagonals. [2]

(d) A polygon with  $n + 1$  sides has 30 more diagonals than a polygon with  $n$  sides.

Find  $n$ . [1]

**0580/42/M/J/10 Q10)**

### Answers

|              |                     |  |
|--------------|---------------------|--|
| Q1) 4140     | Q11) 60             | Q21) (i)24 (ii)3960  |
| Q2) 60       | Q12) 12             | Q22) 126   |
| Q3) 145      | Q13) 24             | Q23) 165   |
| Q4) 135      | Q14) 150            | Q24) (i) 360/5 (ii)(180-72)/2 (iii) 180 – 90 – 72  |
| Q5) 122      | Q15) 160            | Q25) (i)118 (ii) 31(iii)22   |
| Q6) 90       | Q16) 175            | Q26) (a) 48 and 84 , 66 and 66 (b) 540 (c)1620   |
| Q7) 45       | Q17) (5-2)x 180 / 5 | Q27) (c)(i)20 (ii)110  |
| Q8) 9        | Q18) 54             | Q28) pentagon, octagon, 20 (b)(i) 35 (ii) 54<br>(c)(i) $p = 2$ , $q = 3$ (ii) 4850 (iii) 20 (d) 31 |
| Q9) 15       | Q19) 60             |  |
| Q10) decagon | Q20) 18             |  |