

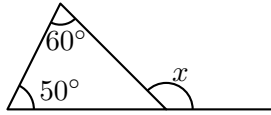
Foundation GCSE: Interior and Exterior Angles

Name: _____

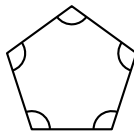
Class: _____

Instructions: Answer all 10 questions. Working out should be shown where appropriate.

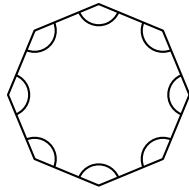
1. Find the exterior angle x given the interior angles 50° and 60° of the triangle.



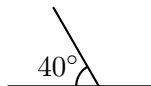
2. Calculate the sum of the interior angles of this pentagon ($n = 5$).



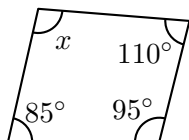
3. Find the size of each interior angle of a regular octagon ($n = 8$).



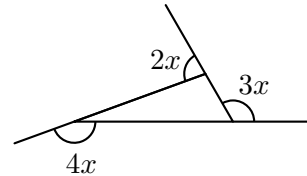
4. Each exterior angle of a regular polygon is 40° . How many sides does it have?



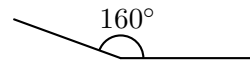
5. Find the missing angle x in the given quadrilateral.



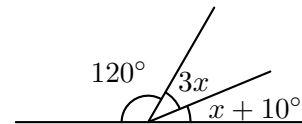
6. The exterior angles of a triangle are $2x$, $3x$, and $4x$. Find the value of x .



7. A regular polygon has an interior angle of 160° . Find its number of sides.



8. The diagram shows an interior angle of 120° of a regular hexagon. The exterior angle is broken up by another line into angles $3x$ and $x + 10^\circ$. What is x ?



9. The sum of interior angles of a polygon is 1260° . Find the number of sides n .

10. Let I and E be the size of the interior and exterior angles of a regular n -gon. Given

$$I = 180^\circ - E$$

$$E = \frac{360^\circ}{n}$$

Find expressions in terms of n (or constants) for:

- The sum of all exterior angles.
- The sum of all interior angles.

Answers & Worked Solutions

1. 110° – Exterior angle equals the sum of the two opposite interior angles ($50 + 60 = 110$).
2. 540° – Formula: $(5 - 2) \times 180 = 540^\circ$.
3. 135° – Exterior angle $= 360/8 = 45^\circ$, Interior angle $= 180 - 45 = 135^\circ$.
4. 9 – Number of sides $n = 360/40 = 9$.
5. 70° – Sum of interior angles of a quadrilateral is 360° ; $360 - (85 + 95 + 110) = 70^\circ$.
6. 40° – Sum of exterior angles is 360° ; $2x + 3x + 4x = 9x = 360 \implies x = 40^\circ$.
7. 18 – Exterior angle $= 180 - 160 = 20^\circ$, $n = 360/20 = 18$.
8. 12.5° – Exterior angle $= 3x + x + 10 = 180 - 120 \implies 4x + 10 = 60 \implies 4x = 50 \implies x = 12.5^\circ$
9. 9 – Formula: $(n - 2) \times 180 = 1260 \implies n - 2 = 7 \implies n = 9$.
10. Let $S(I)$ and $S(E)$ be the sum of the interior and exterior angles, respectively. Then:

$$\begin{aligned}
 S(E) &= nE = 360^\circ \\
 S(I) &= nI \\
 &= n(180^\circ - E) \\
 &= 180^\circ n - 360^\circ = (n - 2) \times 180^\circ
 \end{aligned}$$