Guide to:
Angles in polygons

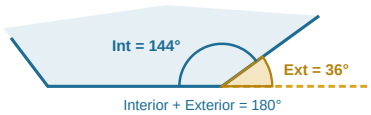
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Explanation:

For any ***n*-sided polygon**: the **Sum of interior angles = (*n* − 2) × 180°**, and the **Sum of exterior angles = 360°**. At every vertex, the interior and exterior angles lie on a straight line, so **Interior + Exterior = 180°**.

For a **regular polygon** (all sides and angles equal), it is always fastest to use the exterior angle first: **One Exterior Angle =** $\frac{360°}{n}$, and **Number of sides *n* =** $\frac{360°}{\text{One Exterior Angle}}$.

Example 1: Work out one **interior angle** of a **regular decagon** (10 sides).



Exterior = 360° ÷ 10 = **36°**
Interior = 180° − 36° = **144°**

Example 2: A regular polygon has an interior angle of **165°**. How many sides does the polygon have?

Solution:

Find the exterior angle first:
Exterior angle = 180° − 165° = **15°**
Number of sides *n* = 360° ÷ 15° = 24
Answer: 24 sides

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