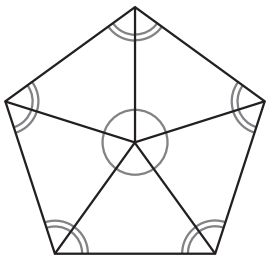
YOU & MATHS **Interior angles of a regular polygon** What is the size of each angle in a regular pentagon? What is the size of each angle in a regular polygon with n sides?

Let us draw a regular pentagon and the centre of the polygon, which is the centre of inscribed circle and circumscribed circle.

Then let us connect each vertex to the centre, thus drawing five isosceles triangles that are all congruent.



Each of the five angles at the centre of the polygon measures:

$\frac{360°}{5} = 72°$.

Therefore, each base angle in the five triangles measures:

$\frac{180° - 72°}{2} = 54°$.

So, each angle of the regular pentagon measures:

$2 \cdot 54° = 108°$.

If we consider a regular polygon with n sides and n angles, we can, in the same way, draw n isosceles triangles. Each of them has the vertex angle that measures:

$\frac{360°}{n}$.

Therefore, each base angle in the n triangles measures:

$\frac{180° - \frac{360°}{n}}{2}$.

Finally, each angle of the regular n-sided polygon measures:

$2 \cdot \frac{180° - \frac{360°}{n}}{2} = 180° - \frac{360°}{n}$.

This final formula is often written as:

$\frac{n-2}{n} \cdot 180°$.