Learning Objective: To solve angles, triangles, and angle relationships.

Quadrilaterals and Polygons

The sum of the exterior angles of any convex polygon is 360°

In any regular n – sided convex polygon, each exterior angle measures:

$$\text{Exterior angles} = \frac{360^\circ}{n}$$

Example

Find the size of each exterior angle of a regular pentagon.

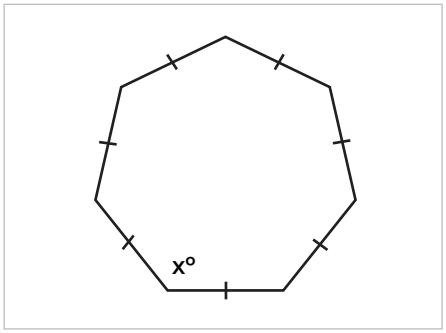
$$\text{Exterior angles} = \frac{360^\circ}{n}$$

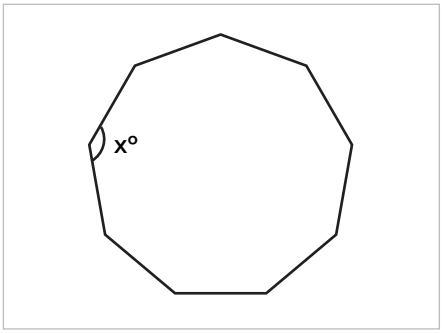
$$= \frac{360^\circ}{5}$$

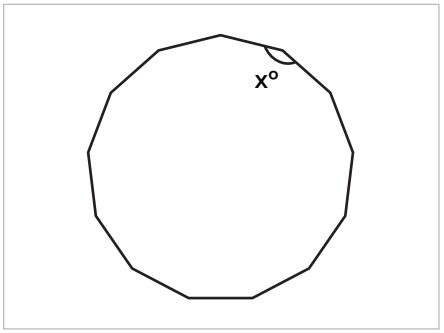
$$= 72^\circ$$

Therefore, each exterior angle is 72°.

Find the angle sum of the regular polygon. Hence, find the value of $x°$







How many sides are there in a regular polygon whose exterior angles each measure:

45°	72°	6°	90°

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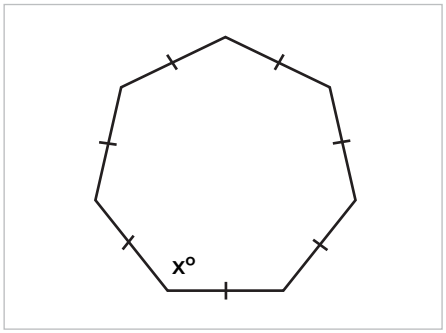
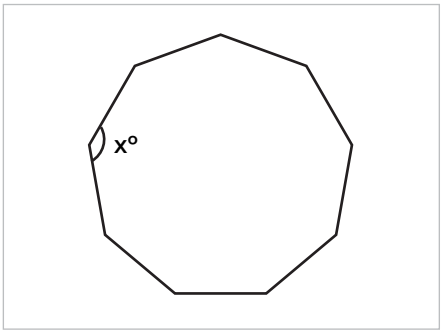
Find the angle sum of the regular polygon. Hence, find the value of x° to the nearest degree.



S = (n – 2) x 180°
= (7 – 2) x 180°
= 900°

Since all angles are equal in a regular polygon,

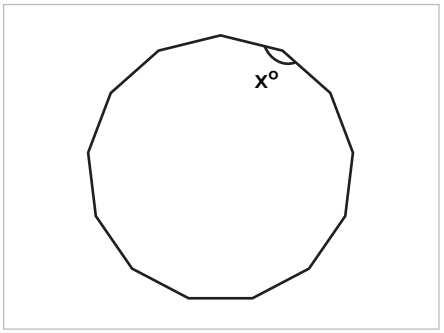
x° = 900 / 7
x° = 129°



S = (n – 2) x 180°
= (9 – 2) x 180°
= 1260°

Since all angles are equal in a regular polygon,

x° = 1260 / 9
x° = 144°



S = (n – 2) x 180°
= (13 – 2) x 180°
= 1980°

Since all angles are equal in a regular polygon,

x° = 1980 / 13
x° = 152°

How many sides are there in a regular polygon whose exterior angles each measure:

45°

Exterior angles = 360° / n
45 = 360° / n
45n = 360
n = 360 / 45
n = 8

Therefore, the polygon has 8 sides.

72°

Exterior angles = 360° / n
72 = 360° / n
72n = 360
n = 360 / 72
n = 5

Therefore, the polygon has 5 sides.

6°

Exterior angles = 360° / n
6 = 360° / n
6n = 360
n = 360 / 6
n = 60

Therefore, the polygon has 60 sides.

90°

Exterior angles = 360° / n
90 = 360° / n
90n = 360
n = 360 / 90
n = 4

Therefore, the polygon has 4 sides.