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.

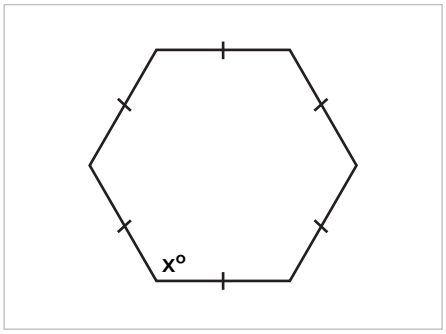
$$\text{Exterior angles} = \frac{360^\circ}{n}$$

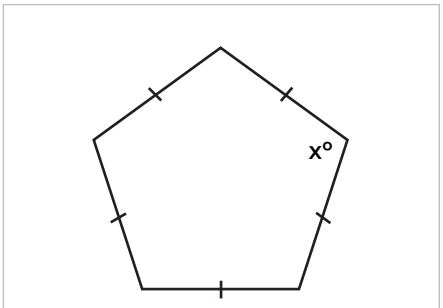
$$= \frac{360^\circ}{5}$$

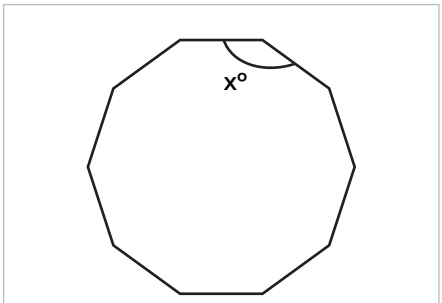
$$= 72^\circ$$

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:

9°	32°	18°	24°

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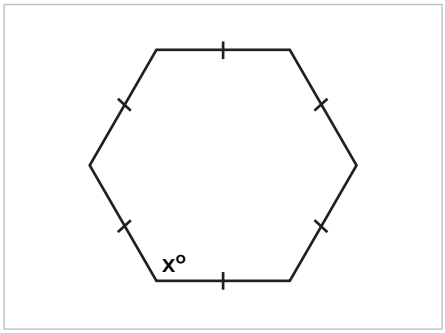
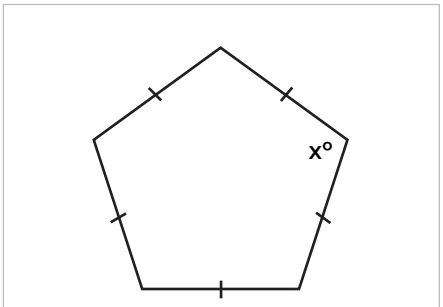


S = (n – 2) x 180°
= (6 – 2) x 180°
= 720°

Since all angles are equal in a regular polygon,

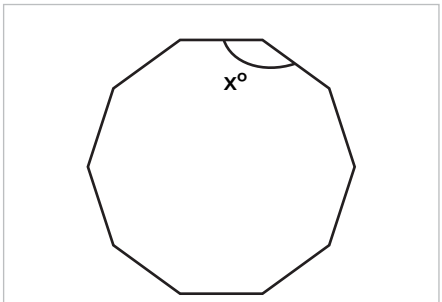
x° = 720 / 6
x° = 120°



S = (n – 2) x 180°
= (5 – 2) x 180°
= 540°

Since all angles are equal in a regular polygon,

x° = 540 / 5
x° = 108°



S = (n – 2) x 180°
= (10 – 2) x 180°
= 1440°

Since all angles are equal in a regular polygon,

x° = 1440 / 10
x° = 144°

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

9°	32°	18°	24°
Exterior angles = 360° / n 9 = 360° / n 9n = 360 n = 360 / 9 n = 40 Therefore, the polygon has 40 sides.	Exterior angles = 360° / n 36 = 360° / n 36n = 360 n = 360 / 36 n = 10 Therefore, the polygon has 10 sides.	Exterior angles = 360° / n 18 = 360° / n 18n = 360 n = 360 / 18 n = 20 Therefore, the polygon has 20 sides.	Exterior angles = 360° / n 24 = 360° / n 24n = 360 n = 360 / 24 n = 15 Therefore, the polygon has 15 sides.