Angle Sum Property of a Quadrilateral

The angle sum property of a quadrilateral states that:

Thesum of all interior angles of a quadrilateral is always 360°.

No matter what the shape of the quadrilateral is—square, rectangle, trapezium, rhombus, or any other—this rule always holds true.

How to Understand It?

A quadrilateral has 4 angles.

If you divide a quadrilateral into 2 triangles by drawing a diagonal, each triangle has a sum of angles = 180°.

So,

- 2 triangles × 180° = 360°
- Therefore, sum of all angles in any quadrilateral = 360°

Properties:

- A quadrilateral has 4 interior angles.
- The sum of the four angles is always 360°.
- If three angles are known, you can always find the fourth angle.
- This property helps in solving many problems based on unknown angles.

Formula:

- Sum of Interior Angles of a Quadrilateral = 360°
- (Always true for any 4-sided polygon)

Example 1:

Find the fourth angle of a quadrilateral if the other three angles are 75°, 95°, and 85°.

Solution:

Let the fourth angle be x.

Using the angle sum property:

 $75^{\circ} + 95^{\circ} + 85^{\circ} + x = 360^{\circ}$

 $\Rightarrow 255^{\circ} + x = 360^{\circ}$ $\Rightarrow x = 360^{\circ} - 255^{\circ} = 105^{\circ}$

Answer: The fourth angle is 105°

Example 2:

In quadrilateral ABCD, the angles are in the ratio 2:3:3:4. Find all four angles.

Solution:

Let the angles be 2x, 3x, 3x, and 4x.

According to angle sum property:

 $2x + 3x + 3x + 4x = 360^{\circ}$

 \Rightarrow 12x = 360°

 \Rightarrow x = 360° ÷ 12 = 30°

So, the angles are:

 $2x = 2 \times 30 = 60^{\circ}$

- $3x = 3 \times 30 = 90^{\circ}$
- 3x = 90°

 $4x = 4 \times 30 = 120^{\circ}$

Answer: The angles are 60°, 90°, 90°, and 120°

Summary Points:

- The sum of all interior angles of any quadrilateral is always 360°.
- This property works for all quadrilaterals—regular and irregular.
- If 3 angles are known, subtract their sum from 360° to find the 4th angle.
- Dividing a quadrilateral into two triangles helps explain the rule: 2 × 180° = 360°