THEME: GEOMETRY AND MEASURES

TOPIC: CIRCLE PROPERTIES – Lesson 4

KAZIBA STEPHEN

7th January 2025

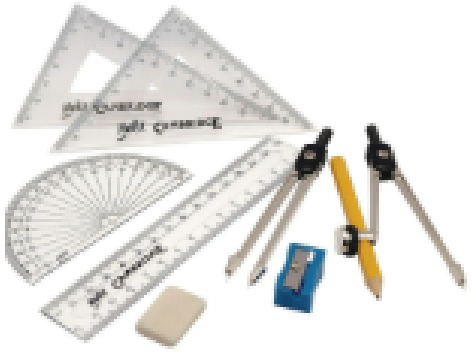
LEARNING OUTCOME

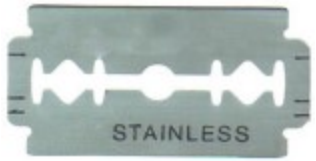
- By the end of this lesson, you should be able to understand and apply the Cyclic Quadrilateral Theorem

Activity: Verifying the Cyclic Quadrilateral Theorem

Materials Needed:

- A piece of plain paper or box cardboard, or a used cake board(Remove the polythene).
- A cup or any object with a circular base for tracing the circle.
- A cutter, razor blade, knife or sharp object to cut the paper (use carefully to avoid injury)
- Mathematical set
- A pencil or pen





Instructions

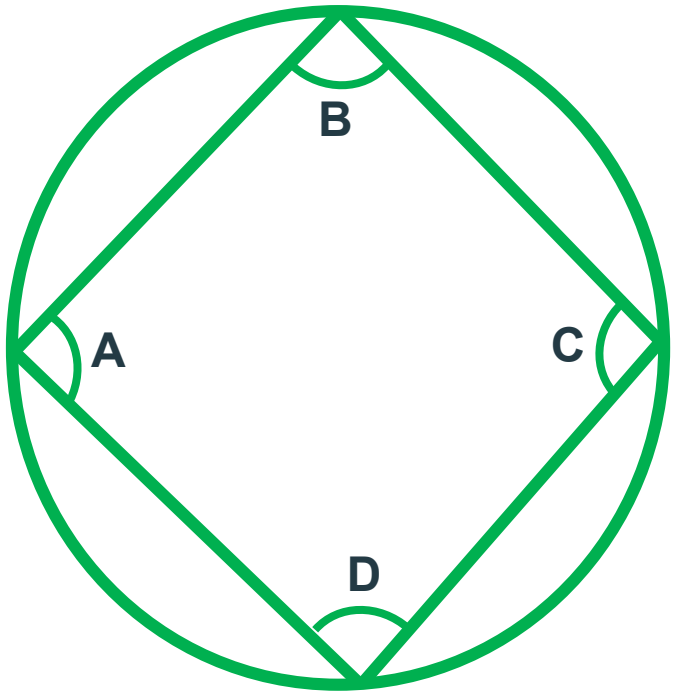
- **Draw the Circle:**
  - Use a compass to draw a circle on the paper or cardboard.
- **Mark Four Points:**
  - Mark four points on the circumference of the circle. Label them AA, BB, CC, and DD.
- **Form the Quadrilateral:**
  - Use a ruler to connect A to B, B to C, C to D, and D to A, forming the cyclic quadrilateral ABCDA.
- **Measure Opposite Angles:**
  - Use a protractor to measure $\angle A$ and $\angle C$. Add these two angles.
  - Similarly, measure $\angle B$ and $\angle D$. Add these two angles.
- **Check the Theorem:**
  - Verify if $\angle A+\angle C=180^\circ$ and $\angle B+\angle D=180^\circ$
- **Test the Exterior Angle Property (Optional):**
  - Extend one side of the quadrilateral, such as BC, beyond point C.
  - Measure the angle formed between this extended line and the opposite side of the quadrilateral ($\angle DAB$\angle DAB).
- Compare this angle with the opposite interior angle ($\angle BCD$\angle BCD) to verify if they are equal.

Outcome

- The sum of opposite angles in the cyclic quadrilateral is always 180∘180^\circ180∘.
- The exterior angle of the cyclic quadrilateral equals the opposite interior angle.

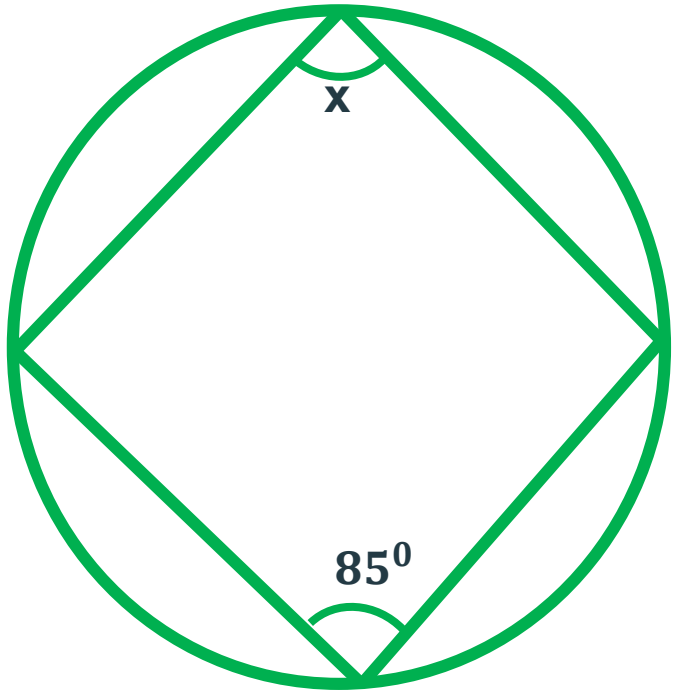
Angles in a cyclic quadrilateral

- **Theorem** : The opposite angles in a cyclic quadrilateral total 180°. .
- The sum of the four angles of any quadrilateral must be 360°.



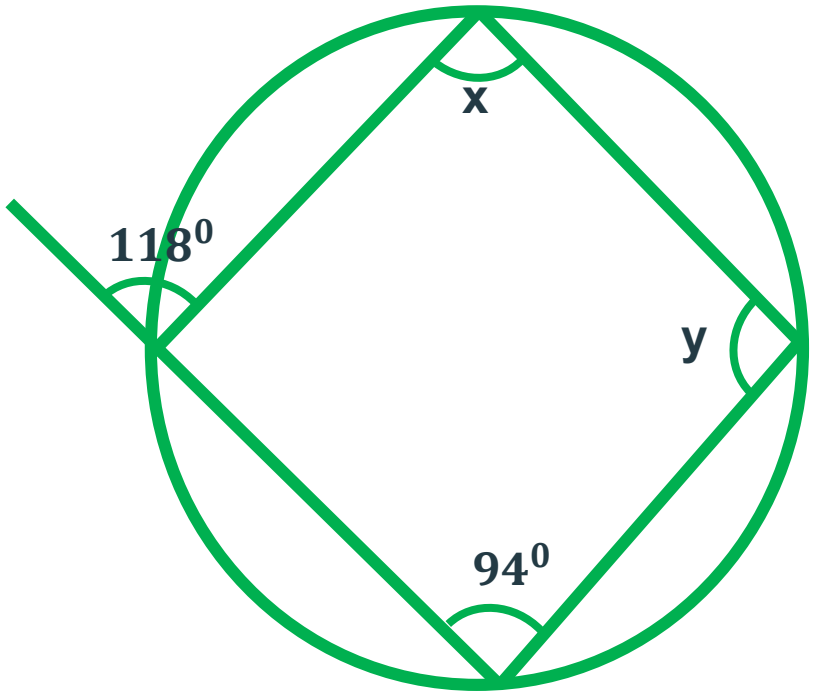
Activity

- *In the circle below, find the size of the angle marked* ***x***



Activity

- *In the circle below, find the size of the angles marked **x and y***



Exercise

Calculate the size of the marked angles