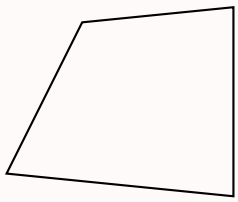
PROPERTIES OF QUADRILATERALS

A QUADRILATERAL CLASSIFICATION

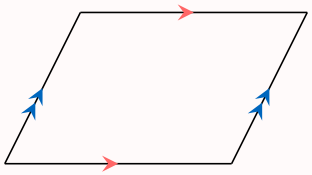
Definition Quadrilateral

A **quadrilateral** is a polygon with four sides.



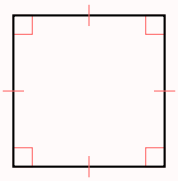
Definition Parallelogram

A **parallelogram** is a quadrilateral with two pairs of opposite sides parallel.



Definition Square

A **square** is a quadrilateral with four right angles and four equal sides.

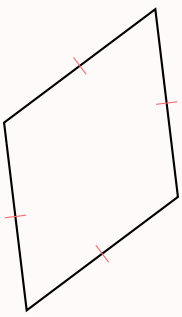


Definition Rectangle

A **rectangle** is a quadrilateral with four right angles.

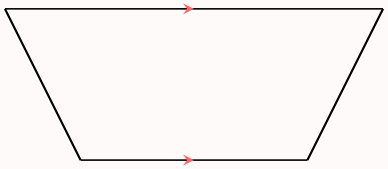
Definition Rhombus

A **rhombus** is a quadrilateral with four equal sides.



Definition **Trapezium**

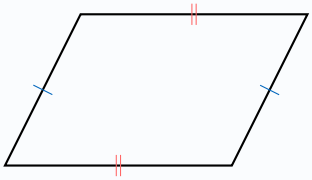
A **trapezium** is a quadrilateral with one pair of opposite sides parallel (in some countries, this is called a *trapezoid*).



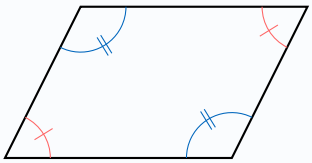
B PROPERTIES

Proposition **Properties of a Parallelogram**

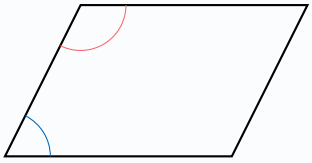
- The opposite sides are equal in length.



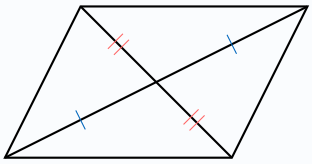
- The opposite angles are equal.



- The adjacent angles are supplementary (they add up to 180°).

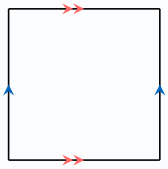


- The diagonals bisect each other (each one is cut in half by the other).

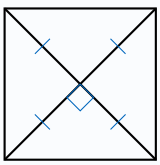


Proposition **Properties of a Square**

- The opposite sides are parallel.

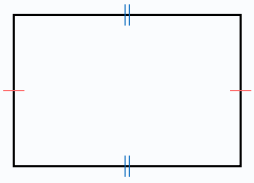


- The diagonals bisect each other, are perpendicular, and are equal in length.

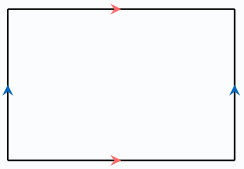


Proposition **Properties of a Rectangle**

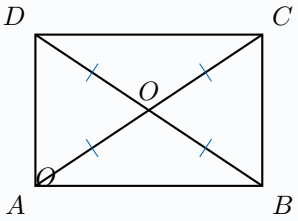
- The opposite sides are equal in length.



- The opposite sides are parallel.

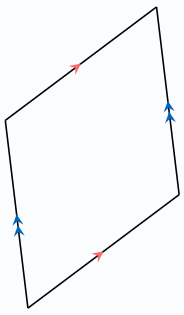


- The diagonals bisect each other and are equal in length.

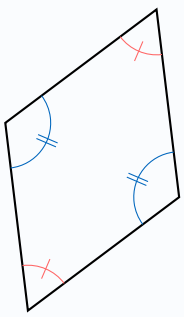


Proposition **Properties of a Rhombus**

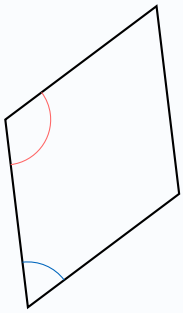
- The opposite sides are parallel.



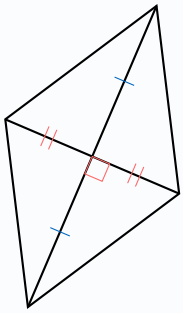
- The opposite angles are equal.



- The adjacent angles are supplementary (they add up to 180°).



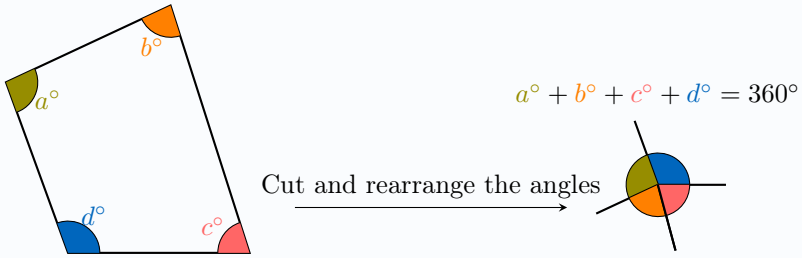
- The diagonals bisect each other at right angles.



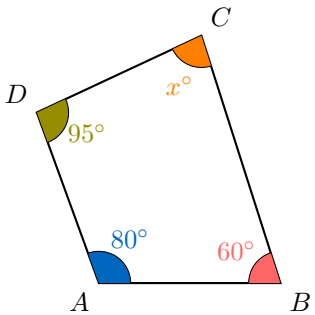
C ANGLES

Proposition Sum of the Angles of a Quadrilateral

The sum of the interior angles of a quadrilateral is 360°.



Ex: Find the unknown angle $x°$.



Answer: The sum of the angles of a quadrilateral is 360°. The three known angles are 60°, 95°, and 80°.

$$
\begin{aligned}
x° + 95° + 80° + 60° &= 360° \\
x° + 235° &= 360° && \text{(adding the known angles)} \\
x° &= 360° - 235° && \text{(subtracting 235° from both sides)} \\
x° &= 125°
\end{aligned}
$$