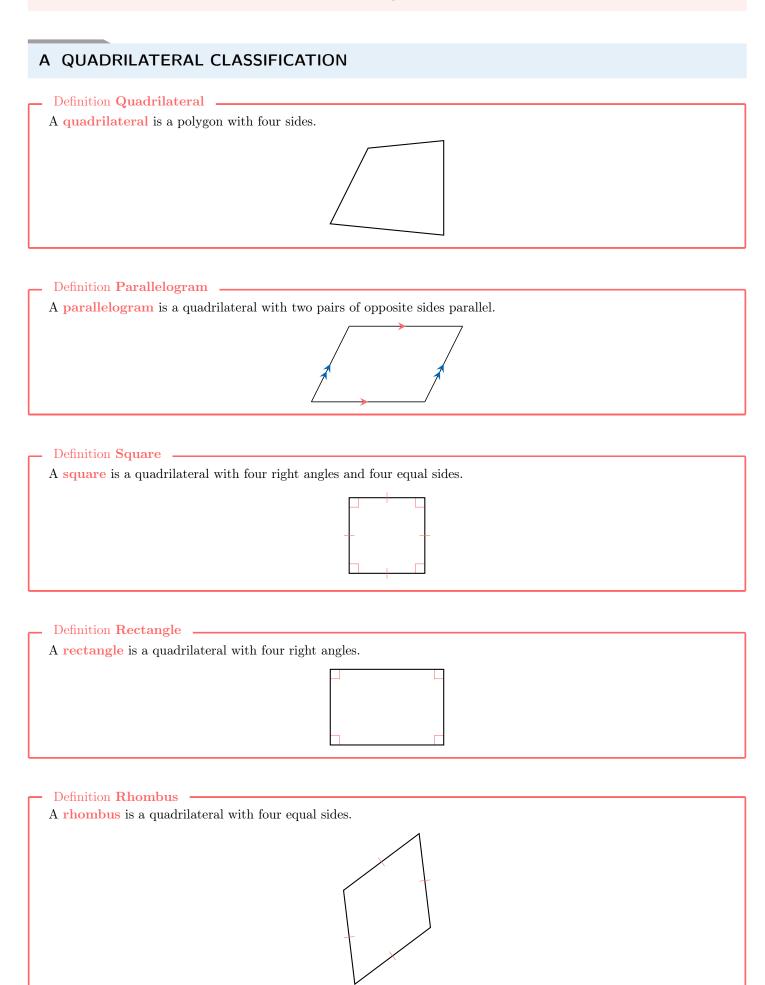
# PROPERTIES OF QUADRILATERALS



#### Definition **Trapezium** —

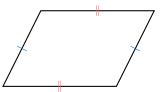
A **trapezium** is a quadrilateral with one pair of opposite sides parallel.



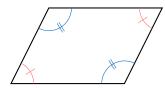
#### **B PROPERTIES**

## Proposition Properties of a Parallelogram

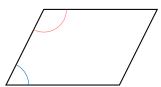
 $\bullet$  The opposite sides are equal in length.



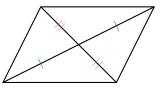
 $\bullet\,$  The opposite angles are equal.



 $\bullet$  The adjacent angles are supplementary.



 $\bullet\,$  The diagonals bisect each other.



#### Proposition Properties of a Square

• The opposite sides are parallel.



 $\bullet$  The diagonals bisect each other at right angles and are equal in length.

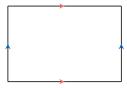


## Proposition Properties of a Rectangle

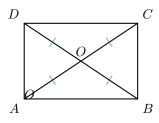
• The opposite sides are equal in length.



• The opposite sides are parallel.

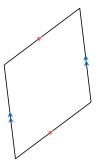


• The diagonals bisect each other and are equal in length.

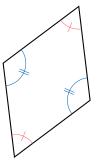


## Proposition **Properties of a Rhombus**

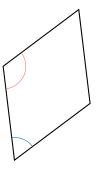
• The opposite sides are parallel.



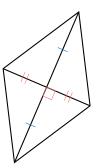
• The opposite angles are equal.



 $\bullet$  The adjacent angles are supplementary.



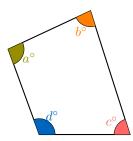
• The diagonals bisect each other at right angles.



## **C ANGLES**

# Proposition Sum of the Angles of a Quadrilateral

The sum of the angles of a quadrilateral is  $360^{\circ}$ .



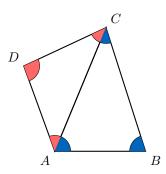
$$a^{\circ} + b^{\circ} + c^{\circ} + d^{\circ} = 360^{\circ}$$

Cut and paste angles

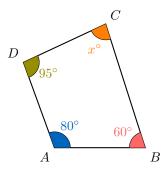


#### Proof

We divide the quadrilateral ABCD into two triangles, ABC and ACD, using the diagonal AC.



Sum of the angles of quadrilateral ABCD = Sum of angles of  $\triangle ABC$  + Sum of angles of  $\triangle ACD$  =  $180^{\circ} + 180^{\circ}$  =  $360^{\circ}$ 



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

$$x^\circ + 95^\circ + 80^\circ + 60^\circ = 360^\circ$$
 
$$x^\circ + 235^\circ = 360^\circ \quad \text{(Adding known angles)}$$
 
$$x^\circ = 360^\circ - 235^\circ \quad \text{(Subtracting 235 from both sides)}$$
 
$$x^\circ = 125^\circ$$

5

