

CHAPTER 08

Quadrilaterals

Quadrilateral:

A quadrilateral is a closed figure formed by four line segments, that no two-line segments cross each other except at their end points.

It has four sides, four angles and four vertices.

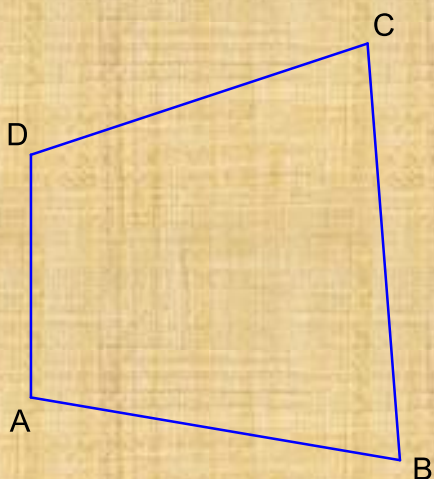
In a quadrilateral ABCD;

$\overline{AB}$, $\overline{BC}$, $\overline{CD}$, $\overline{DA}$ are four sides.

$\angle A$, $\angle B$, $\angle C$, $\angle D$ are four angles.

A, B, C, D are four vertices and $\overline{AC}$, $\overline{BD}$ are two diagonals.

A line segment joining the opposite vertices of a quadrilateral is called diagonal.



$\overline{AB}$ and $\overline{BC}$; $\overline{BC}$ and $\overline{CD}$; $\overline{CD}$ and $\overline{DA}$ are adjacent sides of a quadrilateral ABCD.

$\overline{AB}$ and $\overline{CD}$; $\overline{BC}$ and $\overline{DA}$ are opposite sides of quadrilateral ABCD.

$\angle A$ and $\angle C$; $\angle B$ and $\angle D$ are opposite angles of a quadrilateral ABCD.

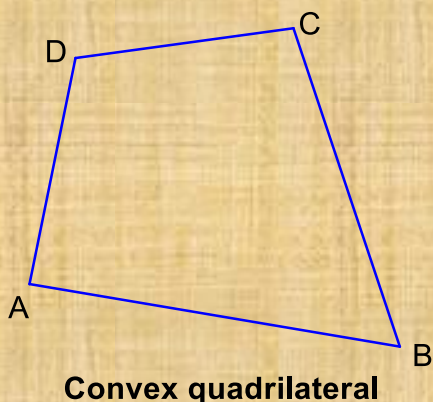
Types of quadrilaterals and properties:

Quadrilateral are classified into two types.

- Convex quadrilateral
- Concave quadrilateral

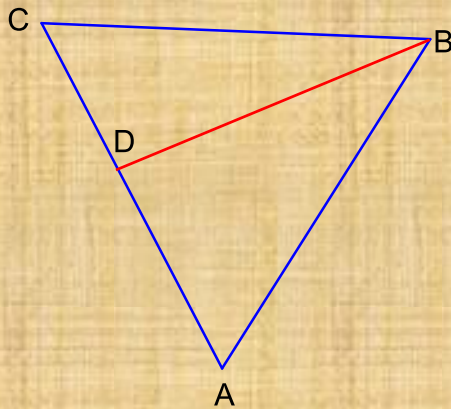
Convex quadrilateral:

A quadrilateral in which the measure of each interior angle is less than 180° is called a convex quadrilateral.



Concave quadrilateral:

A quadrilateral in which the measure of each interior angle is more than 180° is called a concave quadrilateral.



Concave quadrilateral

Each diagonal divides the quadrilateral into two triangles.

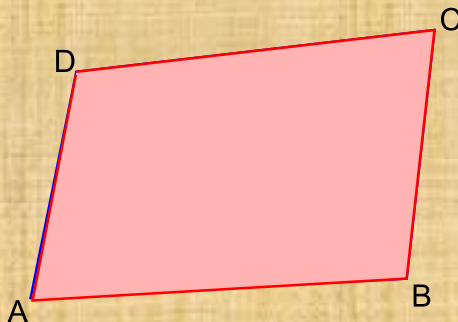
In a convex quadrilateral, both diagonals lie in the interior.

In case of concave quadrilateral one diagonal lies in the interior and the other lies in the exterior.

Sum property of a quadrilateral:

The sum of the four angles of quadrilateral is 360° .

i.e. $\angle A + \angle B + \angle C + \angle D = 360^\circ$



This can be verified by drawing a diagonal and dividing the quadrilateral into two triangles.

