CHAPTER

Practical Geometry

4

A quadrilateral is a polygon with 4 sides, 4 angles and 4 vertices.

Quadrilateral:

Considered 4 line segments AB, BC, CD and DA intersect only at their end points. The figure bounded by these segments is called the "Quadrilateral ABCD".

A quadrilateral consists of ten elements.

(i) 4 slides:

AB, BC, CD, DA

(ii) 4 angles:

$\angle ABC$

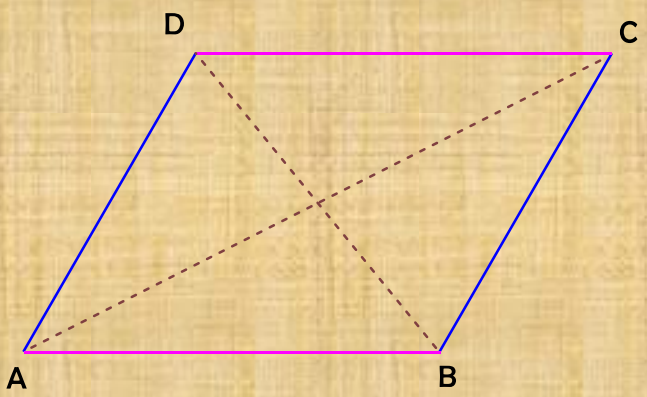
$\angle BCD$

$\angle CDA$

$\angle DAB$

(iii) 2 diagonals:

AC, BD

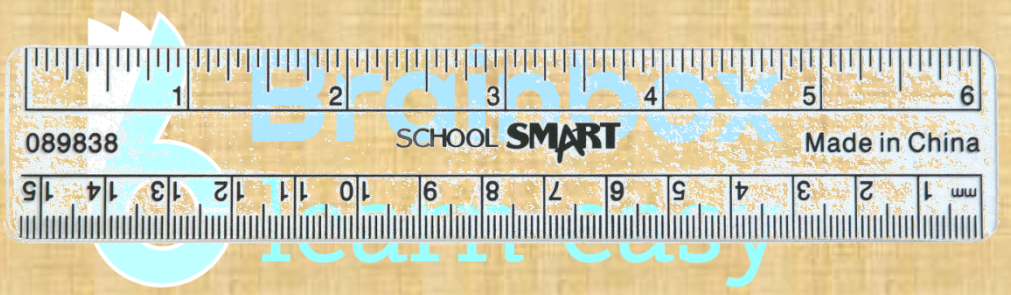


- But to construct it, there is no need to know the measurements of all its elements.
- A diagonal of a quadrilateral divides it into two triangles. So, to construct a quadrilateral using the properties of triangles.
- A unique triangle can be constructed if 3 of the six elements are given.
- Not just any three elements. It can be made with
  - Any three sides (SSS case).
  - Any two sides and the included angle (SAS case).
  - Any two angles and the included side (ASA case).
  - The hypotenuse and a side of a right-angled triangle (RHS case).

Some students are getting doubt when do we construct quadrilaterals in real life? That is easy students, to frame a picture build houses or build a carom board so on.

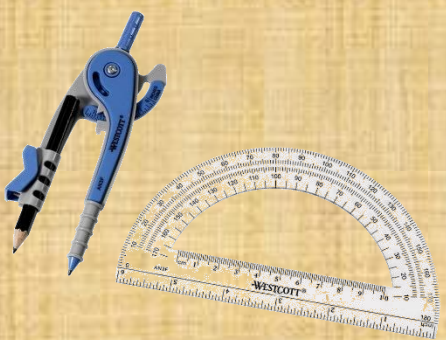
To constructing a quadrilateral, the following equipments are required.

(i) **Ruler**: To draw the line segments and rays.



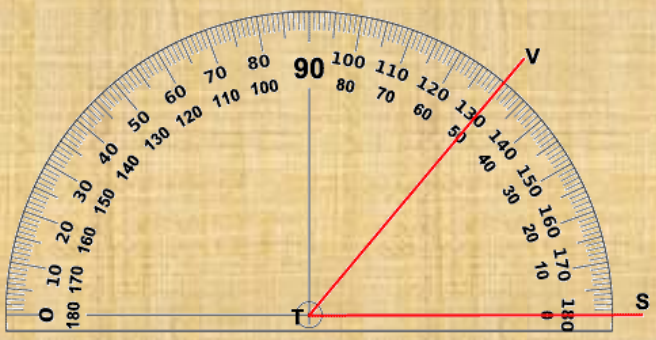
(ii) **Compass**:

To draw the circles, semicircles, arcs.



(iii) **Protractor:**

To measure the angles.



(iv) **A pair of set – squares**:

One with angles 90º, 60º & 30º and other with angles 90º, 45º & 45º.

To draw the parallel lines.

Keep set square along with ruler like and draw one line. Now slide set square some distance then draw one more line as shown in figure. We get parallel lines.

Constructing a quadrilateral:

A unique quadrilateral can be constructed from a specific combination of five elements as given below.

I) Four sides and a diagonal (SSSSD)

II) Two diagonals and three sides (DDSSS)

III) Two adjacent sides and three angles (SSAAA)

IV) Three sides and two included angles (SASAS)

V) Four sides and an angle (SSSSA)

Where, S = Side

A = An angle

D = Diagonal

Construction steps to draw a quadrilateral:

To draw a quadrilateral, follow the steps given below.

Step I: Draw a rough figure of the quadrilateral.

Step II: Mark the given measurements on the rough figure.

Step III: Use the rules for construction of triangles.

Step IV: Write the steps of construction as for the construction of triangles.

Step V: Mark all the given measurements in the quadrilateral constructed.