

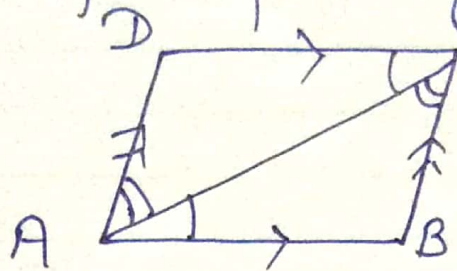
29/08/xx

Class-IXth (MATHS)

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Topic :- Quadrilateral :-

Properties of a parallelogram :- [A quad whose opp sides are parallel is called parallelogram]



1) Theorem :- A diagonal of a parallelogram divides it into two Congruent triangles.

Ans In $\triangle ABC$ and $\triangle ADC$

$$\angle BCA = \angle DAC \quad \{ \text{Alt}^n \text{ int } \angle s \}$$

$$\angle BAC = \angle DCA \quad (\text{''} \text{''})$$

$$AC = AC \quad (\text{Common})$$

$$\therefore \triangle ABC \cong \triangle CDA \text{ by ASA}$$

~~By~~ By C.P.C.T

$$AB = DC$$

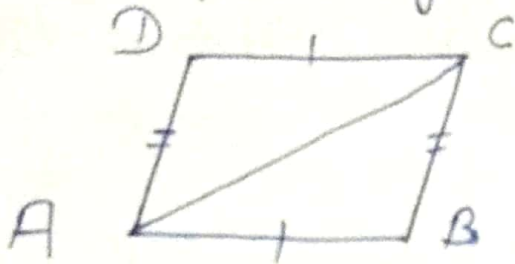
$$AD = BC$$

i.e from here it also proved that

Opp sides of a \parallel^m are equal.

Theorem:- If each pair of opposite sides of a quad is equal, then it is a parallelogram.

Prove \rightarrow



In $\triangle ABC$ and $\triangle ADC$

$$\begin{aligned} AB &= CD \\ BC &= AD \\ AC &= AC \quad (\text{Common}) \end{aligned} \quad \left\{ \text{Given} \right\}$$

$\therefore \triangle ABC \cong \triangle CDA$ by SSS

By CPCT

$$\angle ACD = \angle CAB$$

$$\angle DAC = \angle BCA$$

By converse of Altⁿ interior theorem $AD \parallel BC$ and $AB \parallel CD$

Prove