HW

28/07/2021

Chapter :-8

Quadrilaterals

Exercise 8.1

6) i- In ΔADC and ΔCBA,

$AB = CB$ (Opposite sides of parallelogram)

$DC = BA$ (Opposite sides of parallelogram)

$AC = CA$ (Common side)

$\therefore \Delta ADC \cong \Delta CBA$

Thus,

$\cancel{\angle A = \angle A}$ ~~(Given)~~ $\angle ACD = \angle CAB$ by CPCT

$\cancel{\angle A =}$

and $\angle CAB = \angle CAD$ (Given)

$\Rightarrow \angle ACD = \angle BCA$

Thus,

AC bisects $\angle C$ also.

ii- $\angle ACD = \angle CAD$ (Proved above)

$\Rightarrow AD = CD$ (Opposite sides of equal angles of a triangle are equal)

Also,

$AB = BC = CD = DA$ (Opposite sides of a parallelogram)

Thus,

ABCD is a rhombus

7) Given that,

ABCD is a rhombus

AC and BD are its diagonals.

Proof,

AD = CD (sides of rhombus)

∠DAC = ∠DCA (Angles opposite of equal sides of a triangle are equal)

also, AB ∥ CD

→ ∠DAC = ∠BCA (Alternate interior angles)

→ ∠DCA = ∠BCA

∴ AC bisects ∠C.

Similarly,

We can prove that diagonal AC bisects ∠A.

Following the same method,

We can prove ~~the~~ that diagonal BD bisects ∠B and ∠D.

Date
Page

8) i- $\angle DAC = \angle DCA$ (AC bisects $\angle A$ as well as $\angle C$)

$\Rightarrow AD = CD$ (Sides opposite to equal angles of a triangle are equal)

also, $CD = AB$ (Opposite sides of ~~a~~ rectangle)

$AB = BC = CD = AD$

Thus, $ABCD$ is a square.

ii- In ΔBCD,

$BC = CD$

$\rightarrow \angle CDB = \angle CBD$ (Angles opposite to equal sides are equal)

also, $\angle CDB = \angle ABD$ (~~Alternative~~ Alternate interior angles)

$\rightarrow \angle CBD = \angle ABD$

Thus, BD bisects $\angle B$

Now,

$\angle CBD = \angle ADB$

$\rightarrow \angle CDB = \angle ADB$

Thus,

BD bisects $\angle D$