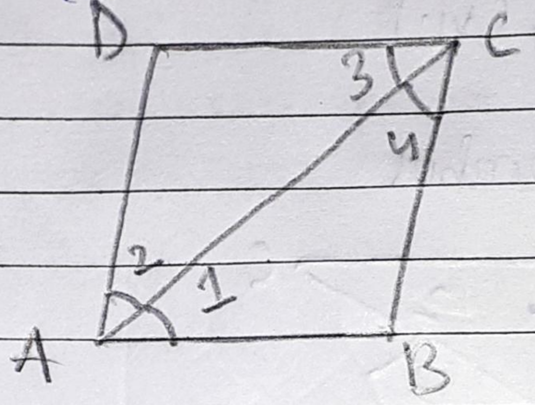
H.W
26.7.21
6. Ans

Ex. 8.1



<u>Given</u> :- AC diagonal bisects $\angle A$. $\angle DAC = \angle BAC$

<u>To prove</u> :- i. AC bisects $\angle C$
ii. ABCD is a rhombus

<u>Proof</u> :- ABCD is a llgm.
AB $\parallel$ DC (AC is a transversal)
$\angle 1 = \angle 3$ (alternate angles) —— (i.)

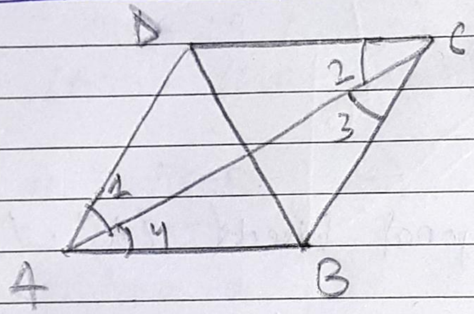
AD $\parallel$ BC (AC is a transversal)
$\angle 2 = \angle 4$ (alternate angles) —— (ii.)
$\angle 1 = \angle 2$ (AC bisects $\angle A$) — (iii)

From (i.), (ii.), (iii.)
i. $\therefore$ AC bisects $\angle C$.

ii. In ΔABC
$\angle 1 = \angle 4$ (from i. & ii.)
$\Rightarrow BC = AB$ —— (iv.)
Similarily
$AD = DC$ —— (v.)
But ABCD is a llgm.
$\therefore AB = DC$ —— (vi.)

From (iv.), (v.), (vi.)
$AB = BC = CD = DA$
$\therefore$ ABCD is a rhombus

7. Ans.



Given :- ABCD is a rhombus
$\Rightarrow AB = BC = CD = DA$
$AB \parallel CD$ & $AD \parallel BC$

To Prove :- i. Diagonal AC bisects $\angle A$ & $\angle C$.
ii. Diagonal BD bisects $\angle B$ & $\angle D$.

Proof :- $CD = AD$
$\Rightarrow \angle 1 = \angle 2$ (angle opposite to equal sides of triangle) —— (i.)

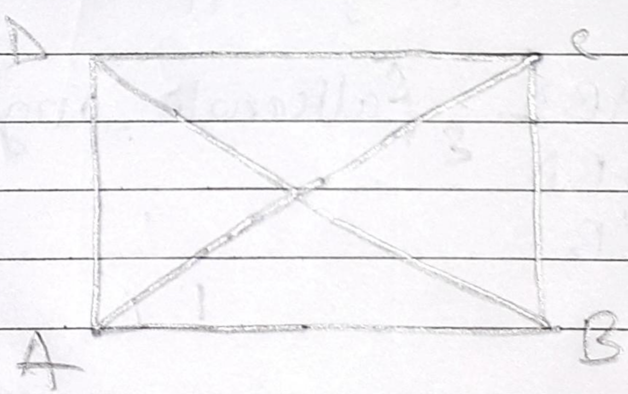
Also, $AD \parallel BC$ (AC is a transversal)
$\Rightarrow \angle 1 = \angle 3$ —— (ii.) (alternate angles)

From (i.) & (ii.)
$\Rightarrow \angle 2 = \angle 3$ ——— (iii.)

$AB \parallel DC$ (AC is a transversal)
$\Rightarrow \angle 2 = \angle 4$ ——— (iv.) (alternate angles)

we have,
$\angle 1 = \angle 4$
i $\therefore$ AC bisects $\angle C$ & $\angle A$
ii. Similarily, we can prove that BD bisects $\angle B$ & $\angle D$.

8. Ans



Given :- ABCD is a rectangle,
AC bisects $\angle A$ & $\angle C$.

To prove :- i. ABCD is a square
ii. diagonal BD bisects $\angle B$ & $\angle D$.

Proof :- $\angle DAC = \angle DCA$

$\Rightarrow AD = CD$ (sides opposite to equal angles of triangle)

Also, $CD = AB$ (opposite sides of rectangle)

$\therefore AB = BC = CD = AD$

i. $\therefore$ ABCD is a square.

In $\triangle BCD$

$BC = CD$

$\Rightarrow \angle CDB = \angle CBD$ (angles opposite to equal sides are equal)

$\angle CDB = \angle ABD$ (alternate angles)

$\Rightarrow \angle C\cancel{BB}BD = \angle ABD$

ii. $\therefore$ BD bisects $\angle B$

Now,

$\angle C\cancel{B}DB = \angle ADB$

iii. $\therefore$ BD bisects $\angle D$.