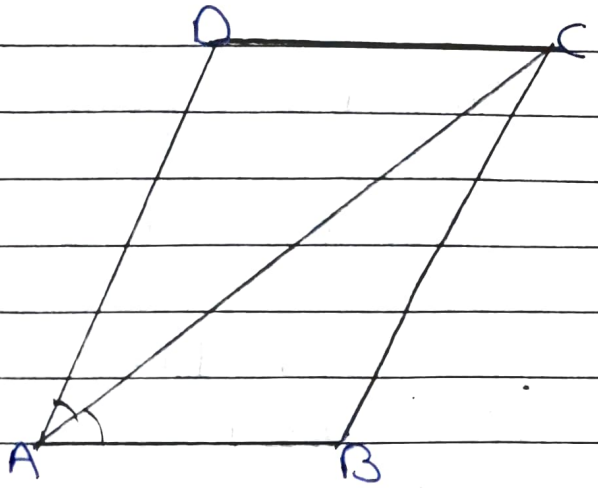
HW

Ex:- 8.1

6) Diagonal AC of a parallelogram ABCD bisects ∠A.

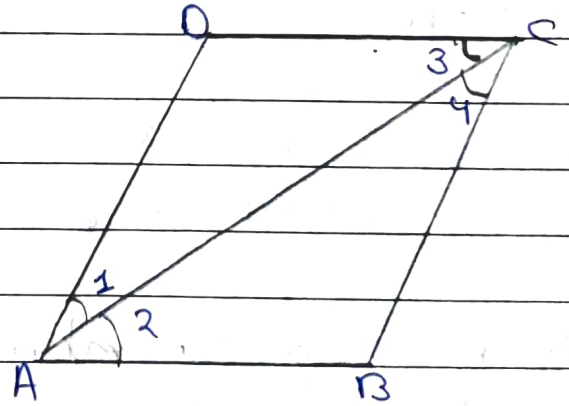
i) it bisects ∠C also,
ii) ABCD is a rhombus.



Ans:- Given:- parallelogram ABCD
where ∠1 = ∠2

To prove:- AC bisects ∠C
i.e ∠3 = ∠4

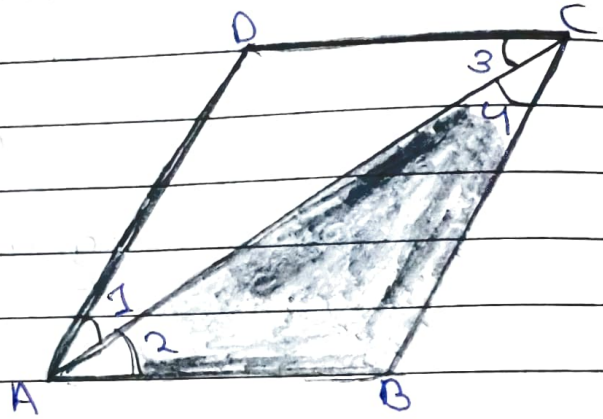
proof:
Now
∠1 = ∠2
∠2 = ∠3
∠1 = ∠4.



Hence, we can say that
∠1 = ∠2 = ∠3 = ∠4.
So, ∠3 = ∠4
Hence proved.

Ans 3) Rhombus is a parallelogram with all sides equal ABCD is a parallelogram So, we have to prove all sides are equal

In first part we proved that
$\angle 1 = \angle 2 = \angle 3 = \angle 4$
Hence, $\angle 2 = \angle 4$



Now, in ΔABC
$\angle BAC = \angle BCA$
Hence,
$BC = AB$

also,
$AB = CD$
& $AD = BC$

$AB = BC = CD = DA$
Hence, ABCD is a rhombus

7) ABCD is a rhombus. Show that diagonal AC bisects $\angle A$ as well as $\angle C$ and diagonal BD bisects $\angle B$ as well as $\angle D$.

Ans) Given :-
Rhombus ABCD

To prove :-

i) AC bisects $\angle A$ i.e $\angle 1 = \angle 2$ & bisects $\angle C$, i.e. $\angle 3 = \angle 4$

iii) BD bisects $\angle D$ & $\angle B$

proof :-

In $\triangle ABC$,
$AB = BC$
So, $\angle 4 = \angle 2$

Now, $AD \parallel BC$ and transversal AC.	Now, $AB \parallel DC$ and transversal AC.
$\angle 1 = \angle 4$	$\angle 2 = \angle 3$
From (1) & (2)	From (1) & (3)
$\angle 1 = \angle 2$	$\angle 4 = \angle 3$
$\Rightarrow$ AC bisects $\angle A$	$\Rightarrow$ AC bisects $\angle C$.

Hence,
AC bisects $\angle C$ & $\angle A$
Similarly we can prove that
BD bisects $\angle B$ & $\angle D$
Hence proved.

8) ABCD is a rectangle in which diagonal AC bisects $\angle A$ as well as $\angle C$. Show that:

i) ABCD is a square
ii) diagonal BD bisects $\angle B$ as well as $\angle D$.

Ans:) Given:-
Rectangle ABCD where
AC bisects $\angle A$, i.e. $\angle 1 = \angle 3$
& AC bisects $\angle C$, i.e. $\angle 3 = \angle 4$

To prove:- ABCD is a square.

proof:- A square is a rectangle when all sides are equal.

Now,
AD || BC
& AC as transversal
$\angle 1 = \angle 4$

Now,
$\angle 1 = \angle 3$
& $\angle 1 = \angle 4$
Hence,
$\angle 2 = \angle 4$

In $\triangle ABC$,
$\angle 2 = \angle 1$
So, $BC = AB$
But $BC = AD$ & $AB = DC$

From (1) & (2)
$AB = BC = CD = DA$
So, ABCD is a rectangle with all sides equal.
Hence, ABCD is a square.

Ans 2) ⇒ ABCD is a square

⇒ And diagonals of a square bisects its angles.

⇒ So, Diagonal BD bisects ∠B & ∠D.

Hence proved.