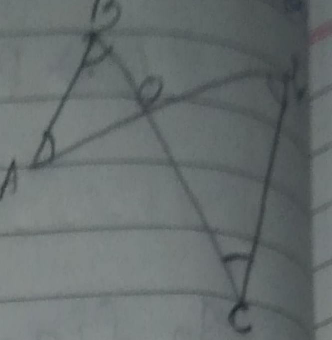
3) In fig. $\angle B < \angle A$ and $\angle C < \angle D$. Show that $AD < BC$.



⇒ Given – $\angle B < \angle A$, $\angle C < \angle D$

To prove :- $AD < BC$

proof :- In ΔAOB,

$\because \angle B < \angle A$

$OA < OB$ — ① (sides opposite to larger angle is greater)

In ΔCOD,

$\angle C < \angle D$

$= OD < OC$ — ② (side opposite to longer angle is greater)

Adding ① and ②

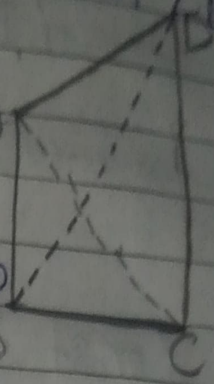
$OA + OD < OB + OC$

$\Rightarrow AD < BC$ (proved.

4) AB and CD are respectively the smallest

and longest sides of a quadrilateral ABCD. Show that $\angle A > \angle C$ and $\angle B > \angle D$

⇒ Given -: AB and CD are smallest and longest sides of the quadrilateral ABCD



To prove -: $\angle A > \angle C$ and $\angle B > \angle D$

~~proof~~ Const -: Join ~~[illegible]~~ AC.

proof -: In $\triangle ABC$

AB is smallest

$AB < BC$

$\angle C < \angle A$

$\angle 3 < \angle 1$ [Angle opposite to larger side is greater] — (I)

In ACD

CD is largest

$AD < CD$

$\angle 4 < \angle 2$ — (II)

$\angle C < \angle A$

Adding (i) and (ii)

$\angle 3 + \angle 4 < \angle 1 + \angle 2$

$\therefore \angle C < \angle A$ (proved)

Const : Join BD

Proof -: In $\triangle ABD$

AB is the smallest

$AB < AD$

$\angle 3 < \angle 1$ — (i) (Angle opposite to larger side are greater)

In $\triangle BCD$:

CD is the largest

$BC < CD$

$\angle 4 < \angle 2$ — (ii)

From (i) and (ii)

$\angle 3 + \angle 4 < \angle 1 + \angle 2$

$\angle D < \angle B$ (proved)