15/02/2021

Exercise 7.4

3) In Fig. 7.49, $B < A$ and $C < D$. Show that $AD < BC$.

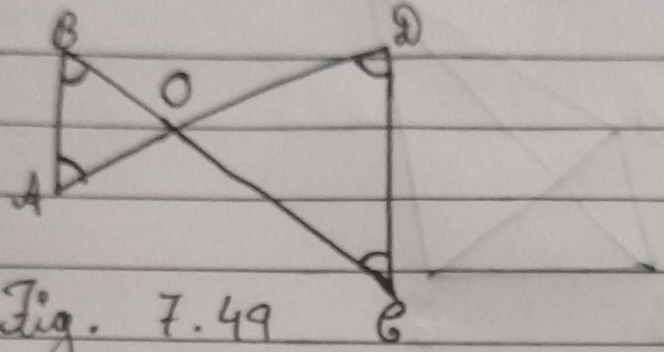

Fig. 7.49

Ans) In the question, it is mentioned that angles B and angle C is smaller than angles A and D respectively i.e. $B < A$ and $C < D$.

Now,

Since the side opposite to the smaller angle is always smaller

$AO < BO$ ------ (i)

And

$OD < OC$ ------ (ii)

By adding equation (i) and (ii) we get,

$AO + OD < BO + OC$

So, $AD < BC$

4) AB and CD are respectively the smallest and largest sides of a quadrilateral ABCD (see Fig. 7.50). Show that $\angle A > \angle C$ and $\angle B > \angle D$.

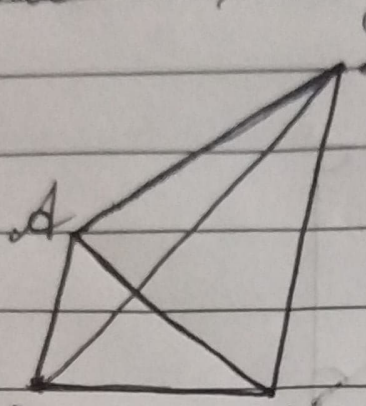

Fig. 7.50

Ans) In $\triangle ABD$, we see that

$AB < AD < BD$

So, $\angle ADB < \angle ABD$ --- (i)

Now, in $\triangle BCD$,

$BC < DC < BD$

Hence it can be concluded that

$\angle BDC < \angle CBD$ ----- (ii)

Now by adding (i) and (ii) we get,

$\angle ADB + \angle BDC < \angle ABD + \angle CBD$

$\angle ADC < \angle ABC$

$\angle C < \angle B$ or $\angle B > \angle D$

Similarly, in triangle ABC,

$\angle ACB < \angle BAC$ ---- (iii)

Now in $\triangle ADC$,

$\angle DCA < \angle DAC$ ---- (iv)

By adding equation (iii) & (iv) we get,

$\angle AGB + \angle DGA < \angle BAG + \angle DAG$

$\rightarrow \angle BGD < \angle BAD$

$\therefore A > G$