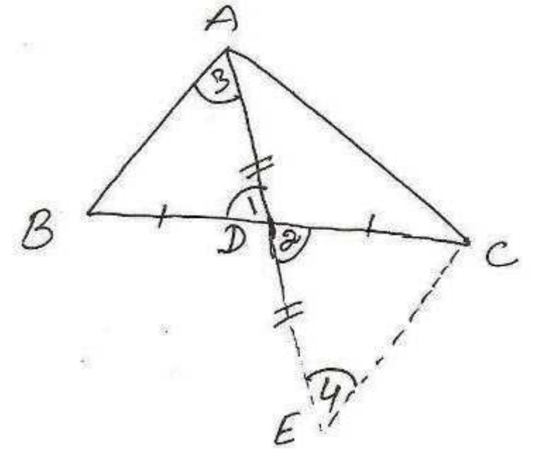
(10)




to prove $AB+AC>2AD$

$AB+BC>2AD$

$BC+AC>2AD$

const - produce AD to E, s.t. $DE=AD$, join EC

proof

In $\triangle ADB$ and $\triangle EDC$

$AD=ED$ (const.)

$\angle 1=\angle 2$ (V.O.As)

$DB=DC$ (given)

$\therefore \triangle ADB \cong \triangle EDC$ by SAS prop.

$AB=EC$ (cpct)

$\angle 3=\angle 4$ (do)

In $\triangle AEC$



$AC+CE>AE$

$AC+CE>AD+DE$

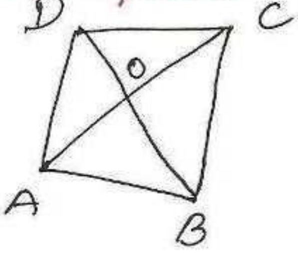
$\Rightarrow AC+CE>2AD$ [$\because AD=DE$]

Similarly

$AB+BC>2AD$

$BC+AC>2AD$

(11)




to prove

$AB+BC+CD+DA<2(BD+AC)$

proof In $\triangle AOB$

$OA+OB>AB$ ... (i)

In $\triangle BOC$

$OB+OC>BC$ ... (ii)

In $\triangle COD$

$OC+OD>CD$ ... (iii)

In $\triangle DOA$

$OD+OA>AD$ ... (iv)

(i) + (ii) + (iii) + (iv)

$OA+OB+OB+OC+OC+OD+OD+OA>AB+BC+CD+DA$

$\Rightarrow 2(OA+OC)+2(OB+OD)>AB+BC+CD+DA$

$\Rightarrow 2(AC+BD)>AB+BC+CD+DA$