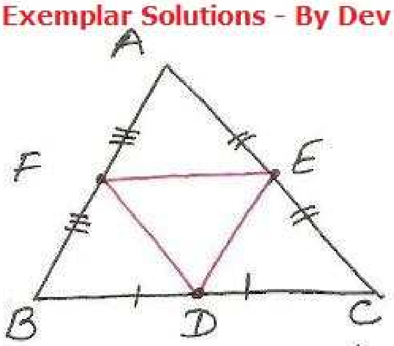
ex 8.3, exemplar IX

(8)



to show - $\triangle DEF$ is equilateral

proof FE joins midpts of sides AB and AC resp.

$\therefore FE = \frac{1}{2} BC$ ... (i)

[Midpt theorem]

Similarly $DE = \frac{1}{2} AB$ ... (ii)

$DF = \frac{1}{2} AC$ ... (iii)

$AB = BC = CA$ ... (iv)

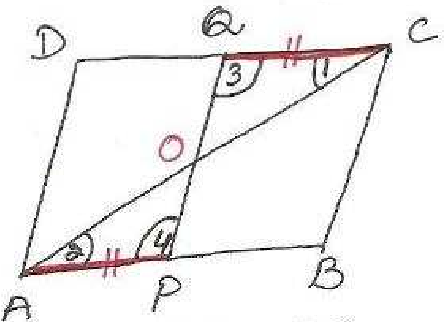
[Sides of equilateral $\triangle$]

From (i), (ii), (iii), (iv)

$DE = EF = FD$

$\therefore \triangle DEF$ is equilateral

(9)



to prove $OA = OC$
$OP = OQ$

proof $DC \parallel AB$ (opp. sides of $\parallel$gm)

$\angle 1 = \angle 2$ (alter. in. $\angle$s)

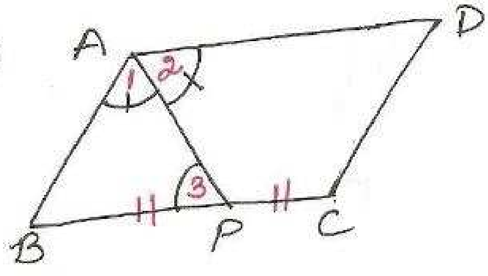
$CQ = AP$ (given)

$\angle 3 = \angle 4$ (al. in. $\angle$s)

$\triangle APO \cong \triangle CQO$ by ASA prop.

$OA = OC$
$OP = OQ$ [c.p.c.t.]

(10)



to prove $AD = 2CD$

proof $AD \parallel BC$ (opp. sides of $\parallel$gm)

$\angle 2 = \angle 3$ [alternate interior $\angle$s]

But $\angle 1 = \angle 2$ (given)

$\therefore \angle 1 = \angle 3$

In $\triangle ABP$, $\angle 1 = \angle 3$

$\Rightarrow BP = AB$

[converse of isos. $\triangle$ prop.]

But $BP = \frac{1}{2} BC$

[$\because$ P is midpt. of BC]

$AB = \frac{1}{2} BC$

$\Rightarrow BC = 2CD$

But $BC = AD$ (opp sides of $\parallel$gm)

$AD = 2CD$

NCERT Exemplar Solutions - By Dev Anoop (Bathinda)