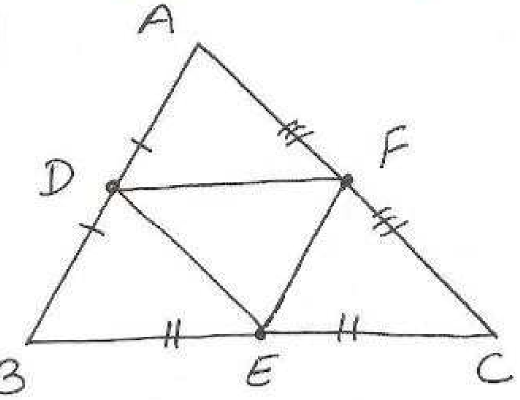
 ex 8.4 exemp IX

(16)



to prove $\triangle DEF \cong \triangle EDB$

$\cong \triangle CFE \cong \triangle FAD$

proof DF joins midpts of sides AB and AC resp. of $\triangle ABC$

$\therefore DF \parallel BC$ (Midpt. theorem)

$\Rightarrow DF \parallel BE$

Sim. $EF \parallel BD$

$\square BEFD$ is a $\parallel$gm

$\triangle DEF \cong \triangle EDB \quad \ldots (i)$

Sim $\triangle DEF \cong \triangle CFE \ldots (ii)$

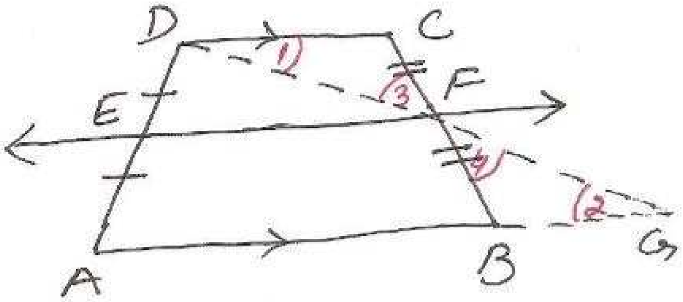
$\triangle DEF \cong \triangle FAD \ldots (iii)$

from (i), (ii), (iii)

$ar(\triangle DEF) \cong \triangle EDB$

$\cong \triangle CFE \cong \triangle FAD$

(17)



to prove $EF \parallel AB \parallel DC$

const - join DF and produce it to intersect AB produced at G

proof In $\triangle DCF$ and $\triangle GBF$

$\angle 1 = \angle 2$ (alternate in. angles $\because DC \parallel BG$)

$\angle 3 = \angle 4$ (ver. opp $\angle$s)

$CF = BF$ (F is midpt. of BC)

$\therefore \triangle DCF \cong \triangle GBF$ by AAS cor.

$DF = GF$ (cpct)

In $\triangle DAG$

EF joins midpts of sides DA and DG resp.

$\therefore EF \parallel AG$ (Midpt th)

$\Rightarrow EF \parallel AB$

But $AB \parallel DC$ (given)

$\therefore EF \parallel AB \parallel DC$