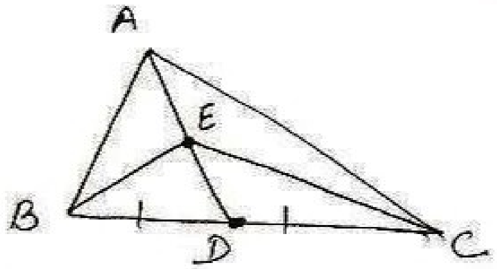
ex 9.3

(1)



To prove ar(ABE) = ar(ACE)

Proof $ar(\triangle ABD) = ar(\triangle ACD)$ ... (I) [Median divides a $\triangle$ into 2 $\triangle$s equal in area]

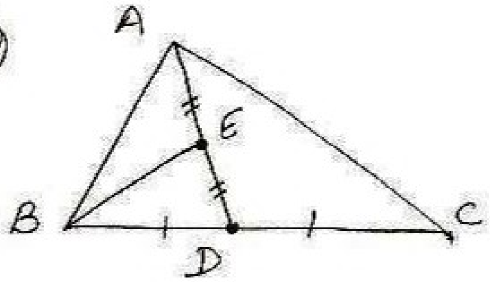
$ar(\triangle EBD) = ar(\triangle ECD)$ ... (II) (do)

(I) − (II)

$ar(\triangle ABD) - ar(\triangle EBD) = ar(\triangle ACD) - ar(\triangle ECD)$

$\Rightarrow ar(\triangle ABE) = ar(\triangle ACE)$

(2)



To show $ar(BED) = \frac{1}{4} ar(ABC)$

Proof $ar(\triangle ABD) = \frac{1}{2} ar(\triangle ABC)$ ... (I)

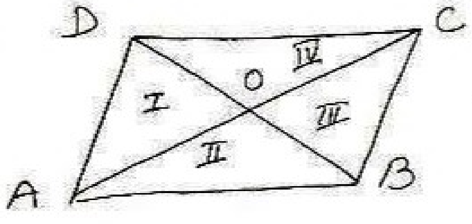
[Median divides a $\triangle$ into 2 $\triangle$s equal in area]

$ar(\triangle BED) = \frac{1}{2} ar(\triangle ABD)$ ... (II) (do)

From (I) and (II)

$ar(\triangle BED) = \frac{1}{4} ar(\triangle ABC)$

(3)



To prove $ar(\triangle I) = ar(\triangle II) = ar(\triangle III) = ar(\triangle IV)$

Proof diagonals of a ||gm bisect each other

$\therefore OA = OC, OB = OD$

In $\triangle DAC$, DO is median to side AC [$\because OA = OC$]

$\therefore ar(\triangle I) = ar(\triangle IV)$ ... (I) [median divides the $\triangle$ into 2 $\triangle$s equal in area]

Sim. $ar(\triangle IV = ar(\triangle III)$ ... (II)

$ar(\triangle III) = ar(\triangle II)$ ... (III)

From (I), (II), (III)

$ar(\triangle I) = ar(\triangle II) = ar(\triangle III) = ar(\triangle IV)$