Date 29.1.21
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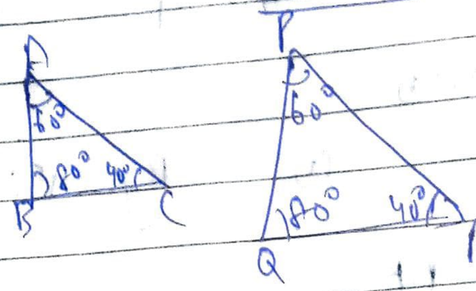
HW

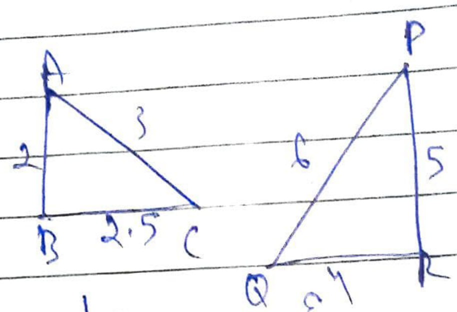
Ex- 6.3

1A (i)



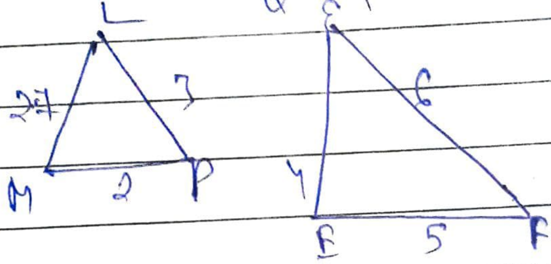
$\angle A = \angle P = 60°$
$\angle B = \angle Q = 80°$
$\angle C = \angle R = 40°$
$\therefore \Delta ABC \sim \Delta PQR$ (AAA)

(ii)



$\frac{AB}{QR} = \frac{BC}{RP} = \frac{CA}{PQ}$
$\Delta ABC \sim \Delta QRP$ (SSS)

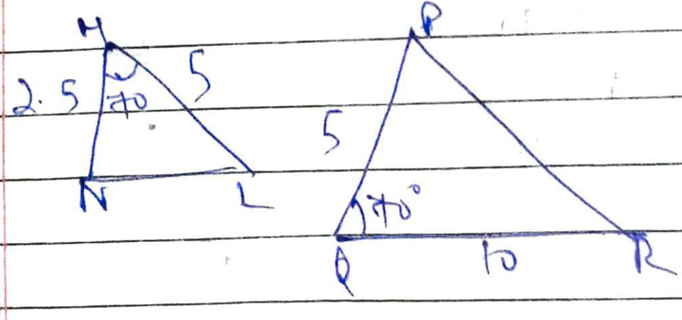
(iii)



In ΔLMP & ΔDEF
$\frac{MP}{DE} = \frac{2}{4} = \frac{1}{2}$
$\frac{PL}{DF} = \frac{3}{6} = \frac{1}{2}$
$\frac{LM}{EF} = \frac{2.7}{5} = \frac{27}{50}$

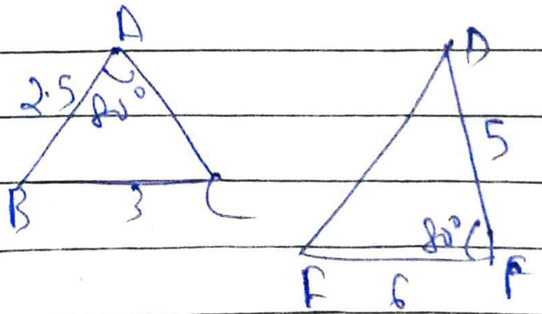
$\frac{MP}{DE} = \frac{PL}{DF} \neq \frac{LM}{EF}$
$\therefore \Delta LMP$ & ΔDEF are not similar

(iv)



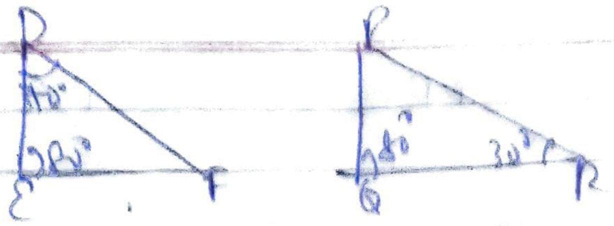
In ΔMNL & ΔQPR
$\frac{MN}{QP} = \frac{ML}{QR} = \frac{1}{2}$
$\angle M = \angle Q = 70°$
$\therefore \Delta MNL \sim \Delta QPR$ (SAS)

(v)



In ΔABC & ΔDEF
$\frac{AB}{DF} = \frac{2.5}{5} = \frac{1}{2}$
$\frac{BC}{EF} = \frac{3}{6} = \frac{1}{2}$
$\Rightarrow \angle B \neq F$
ΔABC & ΔDEF aren't similar

(vi)



In ΔDEF,

$\angle D + \angle E + \angle F = 180^\circ$

$70^\circ + 80^\circ + \angle F = 180^\circ$

$\Rightarrow \angle F = 30^\circ$

In ΔPQR

$\angle P + \angle Q + \angle R = 180^\circ \Rightarrow \angle P + 80^\circ + 30^\circ = 180^\circ$

$\angle P = 70^\circ$

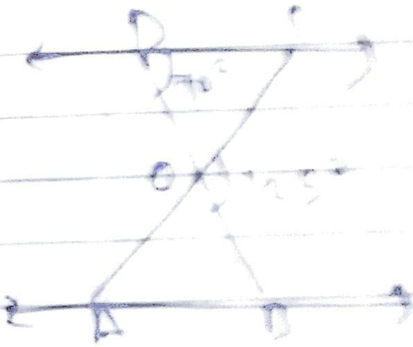
In ΔDEF & ΔPQR

$\angle D = \angle P$ (each 70°)

$\angle E = \angle Q$ (each 80°)

$\angle F = \angle R$ (each 30°)

$\Delta DEF \sim \Delta PQR$ (by AAA)



2A DOB is a straight line

$\therefore \angle DOC + \angle COB = 180^\circ$

$\Rightarrow \angle DOC = 180^\circ - 125^\circ = 55^\circ$

In ΔDOC,

$\angle DCO + \angle CDO + \angle DOC = 180^\circ$

$\Rightarrow \angle DCO + 70^\circ + 55 = 180$

$\Rightarrow \angle DCO = 55^\circ$

$\angle OAB = \angle OCD \Rightarrow \angle OAB = 55^\circ$

3A In ΔDOC & ΔBOA

$\angle CDO = \angle ABO$ (Alternate interior $\angle$)

$\angle DCO = \angle BAO$ (" " ")

$\angle DOC = \angle BOA$ (V.O.A)

$\therefore \Delta DOC \sim \Delta BOA$ (by AAA)

$\therefore \frac{DO}{BO} = \frac{OC}{OA}$ (corresponding sides are proportional)

$\Rightarrow \frac{OA}{OC} = \frac{OB}{OD}$

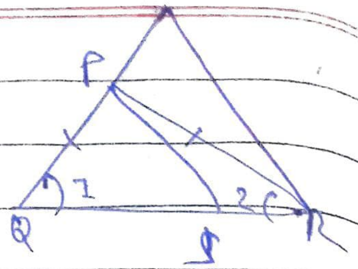
A4. In ΔPQR, $\angle PQR = \angle PRQ$

$\therefore PQ = PR$ — (1)

$\frac{QR}{QS} = \frac{QT}{PR}$

Using eq(1)

$\frac{QR}{QS} = \frac{QT}{QP}$ — (2)



In ΔPQS & ΔTQR

$\frac{QR}{QS} = \frac{QT}{QP}$

$\angle Q = \angle Q$

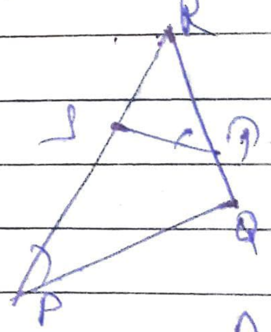
$\therefore \Delta PQS \sim \Delta TQR$ (by SAS)

A5. In ΔRPQ & ΔRST,

$\angle RTS = \angle QPS$ (Given)

$\angle R = \angle R$ (common Angle)

$\therefore \Delta RPQ \sim \Delta RTS$ (AA)



A6. $\Delta ABE \cong \Delta ACD$

$\therefore AB = AC$ (cpct) — (1)

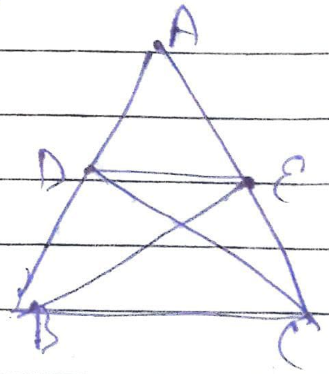
$AD = AE$ (cpct) — (2)

In ΔADE & ΔABC

$\frac{AD}{AB} = \frac{AE}{AC}$

$\angle A = \angle A$ (common Angle)

$\therefore \Delta ADE \sim \Delta ABC$ (by SAS)

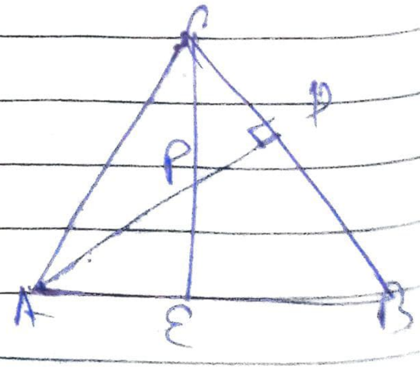


A7 (i) In ΔAEP & ΔCDP

$\angle AEP = \angle CDP$ ($90°$)

$\angle APE = \angle CPD$ (V.O.A)

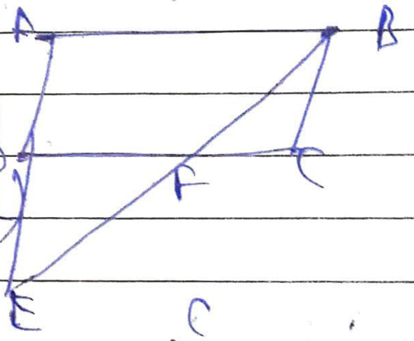
$\Delta AEP \sim \Delta CDP$ (by AA)



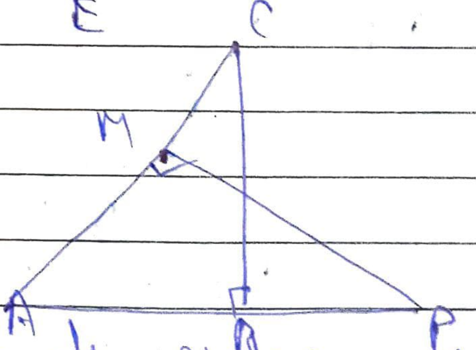
(ii) In ΔABD & ΔCBE
$\angle ADB = \angle CEB$ (90°)
$\angle ABD = \angle CBE$ (common)
So, $\Delta ABD \sim \Delta CBE$ (by AA)

(iii) In ΔAEP & ΔADB,
$\angle AEP = \angle ADB$ (each 90°)
$\angle PAE = \angle DAB$ (common)
$\therefore$ $\Delta AEP \sim \Delta ADB$ (by AA)

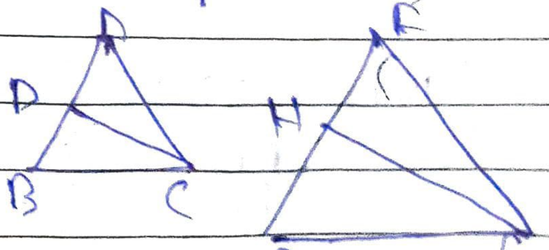
(iv) In ΔPDC & ΔBEC,
$\angle PDC = \angle BEC$ (Each 90°)
$\angle PCD = \angle BCE$ (common angle)
$\therefore$ $\Delta PDC \sim \Delta BEC$ (by AA)



A8. In ΔABE & ΔCFB,
$\angle A = \angle C$ (opposite angles of ||gm)
$\angle AEB = \angle CBF$ (Alternate interior)
$\therefore$ $\Delta ABE \sim \Delta CFB$ (AA)



A9. ΔABC & ΔAMP
$\angle ABC = \angle AMP$ (90°)
$\angle A = \angle A$ (common)
$\therefore$ $\Delta ABC \sim \Delta AMP$ (AA)
$\Rightarrow \dfrac{CA}{PA} = \dfrac{BC}{MP}$ —— (corresponding sides of similar Δ are proportional)



A10. In $\Delta ABC \sim \Delta FEG$
$\therefore$ $\angle A = \angle F$, $\angle B = \angle E$,
$\angle ACB = \angle FGE$

$\angle ACB = \angle FGE$

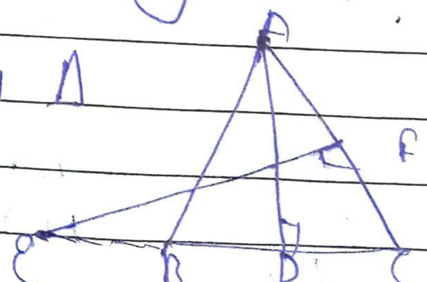
$\therefore \angle ACD = \angle FGH$ (Angle bisector)
$\& \angle DCB = \angle HGE$ (" ")

In ΔACD & ΔFGH,
$\angle A = \angle F$
$\angle ACD = \angle FGH$
$\therefore \Delta ACD \sim \Delta FGH$ (by AA)
$\Rightarrow \frac{CD}{GH} = \frac{AC}{FG}$

In ΔDCB & ΔHGE
$\angle DCB = \angle HGE$
$\angle B = \angle E$
$\therefore \Delta DCB \sim \Delta HGE$ (By AA)

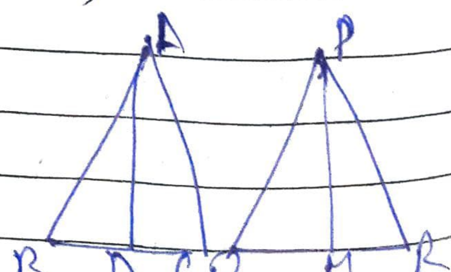
In ΔDCA & ΔHGF
$\angle ACD = \angle FGH$
$\angle A = \angle F$
$\therefore \Delta DCA \sim \Delta HGF$ (By AA)

11A ABC is an is isosceles Δ



$AB = AC$
$\Rightarrow \angle ABD = \angle ECF$
In ΔABD & ΔECF,
$\angle ADB = \angle EFC$ $(90°)$
$\angle ABD = \angle ECF$
$\therefore \Delta ABD \sim \Delta ECF$ (by AA)

12A $BD = \frac{BC}{2}$ & $QM = \frac{QR}{2}$



$\frac{AB}{PQ} = \frac{BC}{QR} = \frac{AD}{PM}$

$\Rightarrow \frac{AB}{PQ} = \frac{\frac{1}{2} \times BC}{\frac{1}{2} QR} = \frac{AD}{PM}$

2) $\frac{AB}{PQ} = \frac{BD}{QM} = \frac{AD}{PM}$

In ΔABD & ΔPQM,

$\frac{AB}{PQ} = \frac{BD}{QM} = \frac{AD}{PM}$

$\therefore \Delta ABD \sim \Delta PQM$ (by SSS)

$\Rightarrow \angle ABD = \angle PQM$

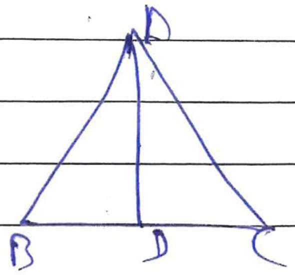
In ΔABC & ΔPQR

$\angle ABD = \angle PQM$

$\frac{AB}{PQ} = \frac{BC}{QR}$

$\therefore \Delta ABC \sim \Delta PQR$ (by SAS)

13A In ΔADC & ΔBAC



$\angle ADC = \angle BAC$

$\angle ACD = \angle BCA$

$\therefore \Delta ADC \sim \Delta BAC$ (by AA)

$\therefore \frac{CA}{CB} = \frac{CD}{CA}$

$\Rightarrow CA^2 = CB \times CD$

14A ~~$\Delta ABC \sim \Delta PQR$~~

In ΔABD & ΔEDC

$AD = DE$

$\angle ADB = \angle EDC$ (VOA)

$BD = DC$ (AD is median)

$\Delta ABD \cong \Delta EDC$ (by SAS)

$AB = CE$ (CPCT)

$PQ = RN$ & $\angle 1 = \angle 2$

$\frac{AB}{PQ} = \frac{AD}{PM} = \frac{AC}{PR}$

$\frac{CE}{RN} = \frac{2AD}{2PM} = \frac{AC}{PR}$

$\frac{Q}{RN} = \frac{PE}{PN} = \frac{AC}{TP}$

(by SSS)

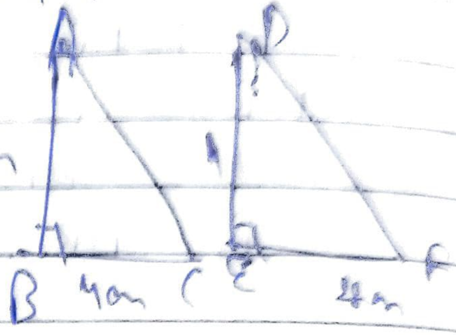
$\Delta AEC \sim \Delta PNR$

$\angle 3 = \angle 4$

$\angle 1 = \angle 2$

$\angle 1 + \angle 3 = \angle 2 + \angle 4$ (by SAS)

$\Delta ABC \sim \Delta PQR$



15A: In ΔABC & ΔDEF

$\angle B = \angle E = (90^\circ)$

$\angle C = \angle F$

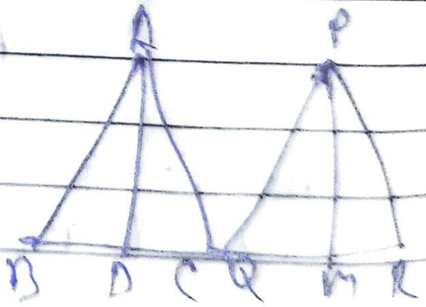
$\therefore \Delta ABC \sim \Delta DEF$ (by AA)

Thus $\frac{AB}{DE} = \frac{BC}{EF}$

$\Rightarrow \frac{6}{h} = \frac{4}{28}$ $\Rightarrow \frac{6}{h} = \frac{1}{7}$

$\Rightarrow h = 42$

$DE = 42\,m$



16A $\Delta ABC \sim \Delta PQR$

$\frac{AB}{PQ} = \frac{AC}{PR} = \frac{BC}{QR}$

D is mid point of BC

$BD = DC$

M is mid point of QR

$QM = MR$

$\therefore \frac{BC}{QR} = \frac{BD}{QM}$

In ΔABD & ΔPQM

$\frac{AB}{PQ} = \frac{BD}{QM} = \frac{AD}{PM}$

$\therefore \frac{AB}{PQ} = \frac{AD}{PM}$