4. Construction of Triangles

Extra Question

Q.1 Construct Δ ABC in which ∠ABC = 72°, BC = 6.5cm and AB + BC = 8 cm

Solution: As shown in the rough figure first we draw seg BC= 6.5 cm of length .on the ray making an angle of 72° With seg BC mark point D such that

BD = AB + AC = 8 cm

Now we have to locate point A on ray BD

BA + AD = BA + AC = 8 cm

AD = AC

Point A is on the Perpendicular bisector of seg CD.

The point of intersection of ray BD and the perpendicular Bisector of seg CD at point A.

Steps of construction:

I) Draw seg BC of length 6.5 cm

II) Draw ray BQ such that ∠CBQ =72°

III) Mark point D on ray BQ at 8 cm from point B.

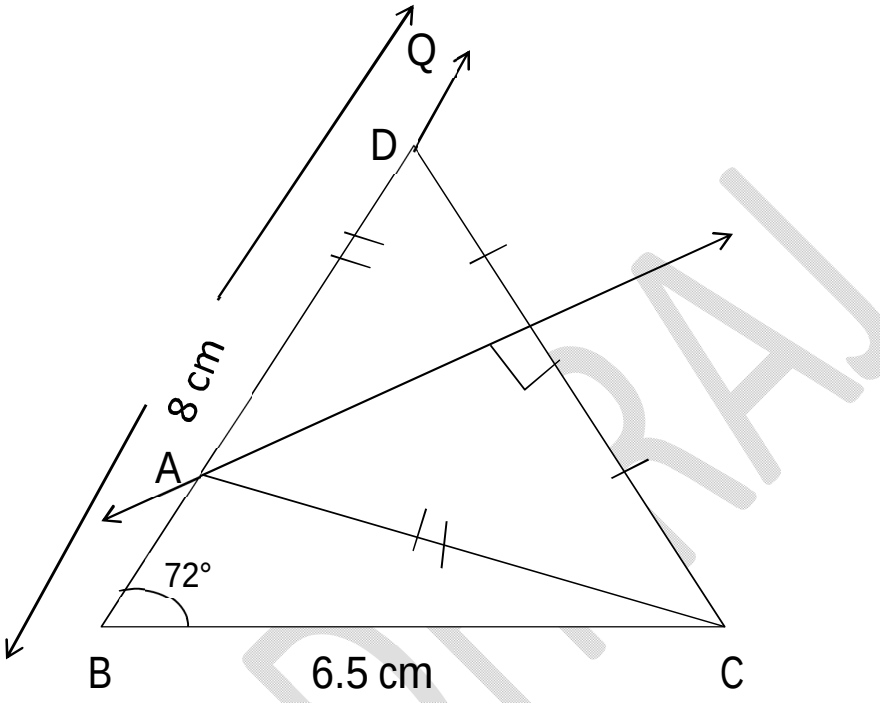
IV) Join points C and D

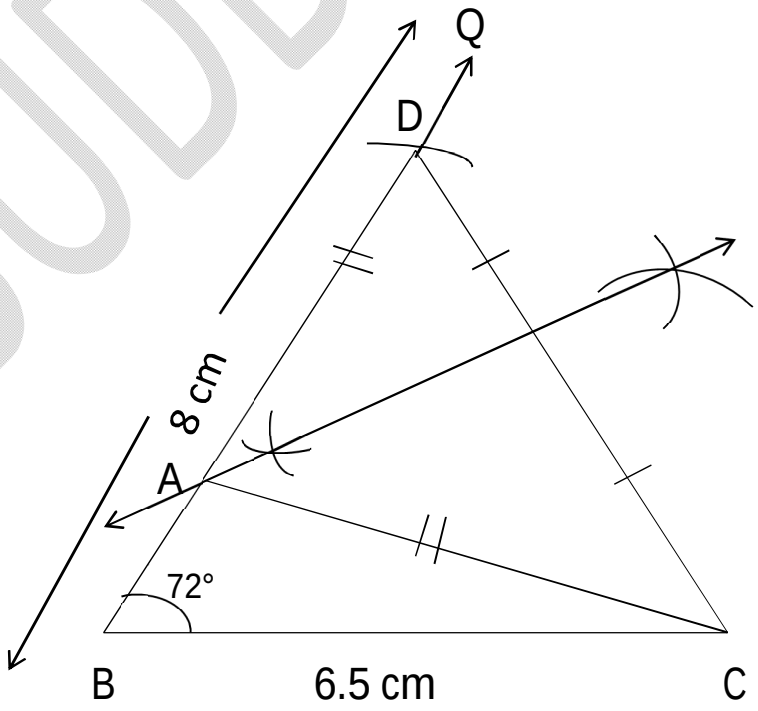
V) Draw perpendicular bisector of seg CD and let it

intersect ray BQ name the intersection point as Point A

VI) Draw seg AC.

Δ ABC is required triangle.





Q.2) Construct Δ PQR, PQ = 3.9 cm,QR + PR = 7.9 cm ∠P = 67°

Solution: As shown in the rough figure, first we draw seg PQ = 3.9 cm of length on the ray making an angle of 67°

With seg PQ mark point B such that

PB = PR + RQ = 7.9 cm

Now we have to locate point R on ray PB

PR + RB = PR +RQ = 7.9 cm

RB = RQ

∴Point R is on the perpendicular bisector of seg BQ

∴ The point of intersection of ray PB and the perpendicular bisector of seg QB at Point R.

Steps of construction:

i) Draw seg PQ of length 3.9 cm

ii) Draw ray PA such that ∠QPA = 67°

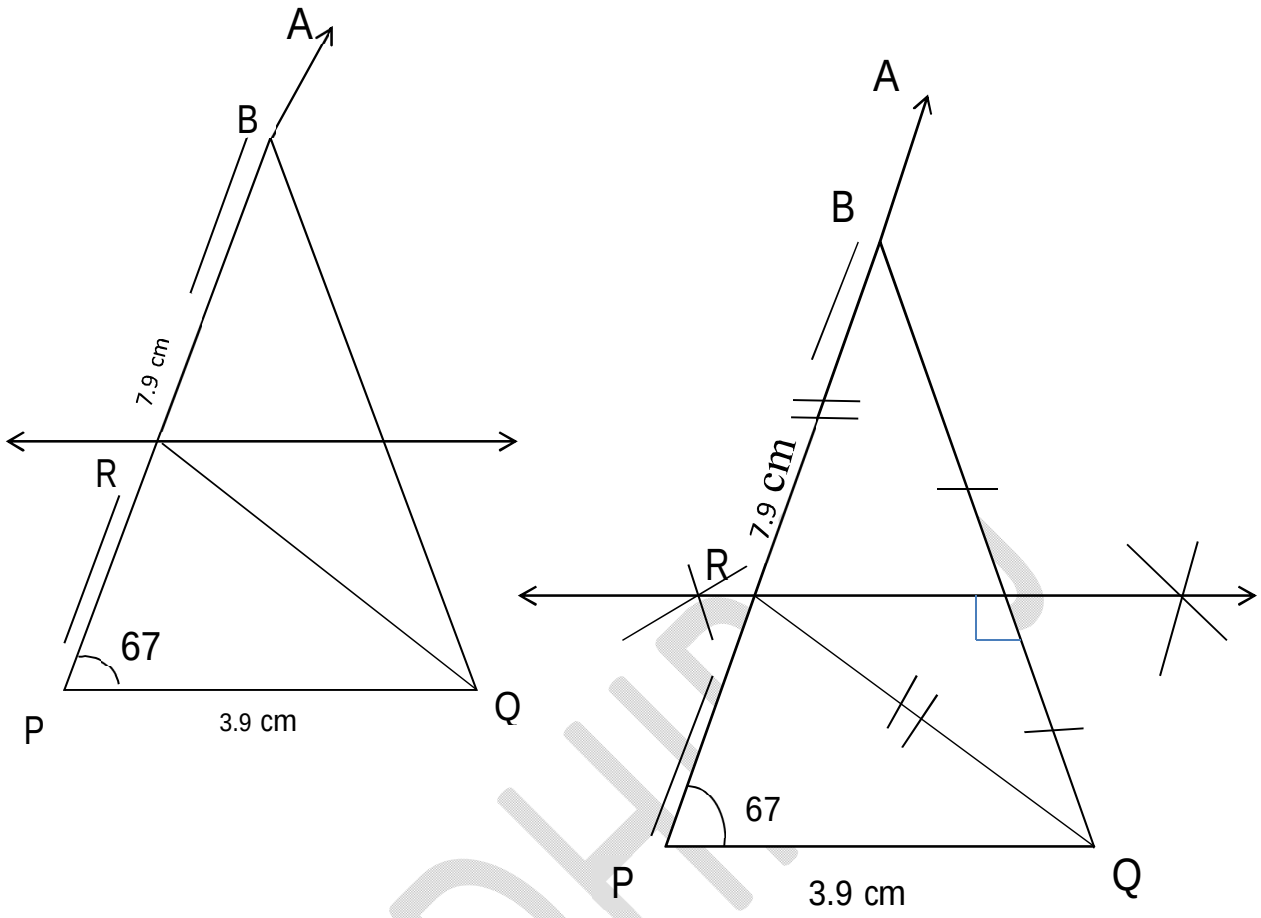
iii) Mark point P on ray PA at 7.9 cm from point B.

iv) Join point Q and D.

v) Draw perpendicular bisector of seg QB and let it intersect ray PB. Name the intersection point as point R.

vi) Draw seg RQ

Δ PQR is required triangle.



Q. 3) Construct Δ ABC BC = 6 cm ∠ABC = 70°, and and

AB + BC = 10.5 cm

Solution: As shown in the rough figure ,first we draw seg BC = 6 cm of length . on the ray making an angle of 70°

With seg BC, mark point M such that

BM = AB + AC = 10.5 cm

Now we have to locate point A on ray BM

BA + AM = BA + AC = 10.5 cm

AM = AC

Point A is on the perpendicular bisector of seg QB.

The point of intersection of ray BM and the

Perpendicular bisector of seg AM is point A.

Steps of construction:

I) Draw seg BC of length 6 cm

II) Draw ray BL such that ∠ABC =70°

III) Mark point B on ray BL at 10.5 cm from point M.

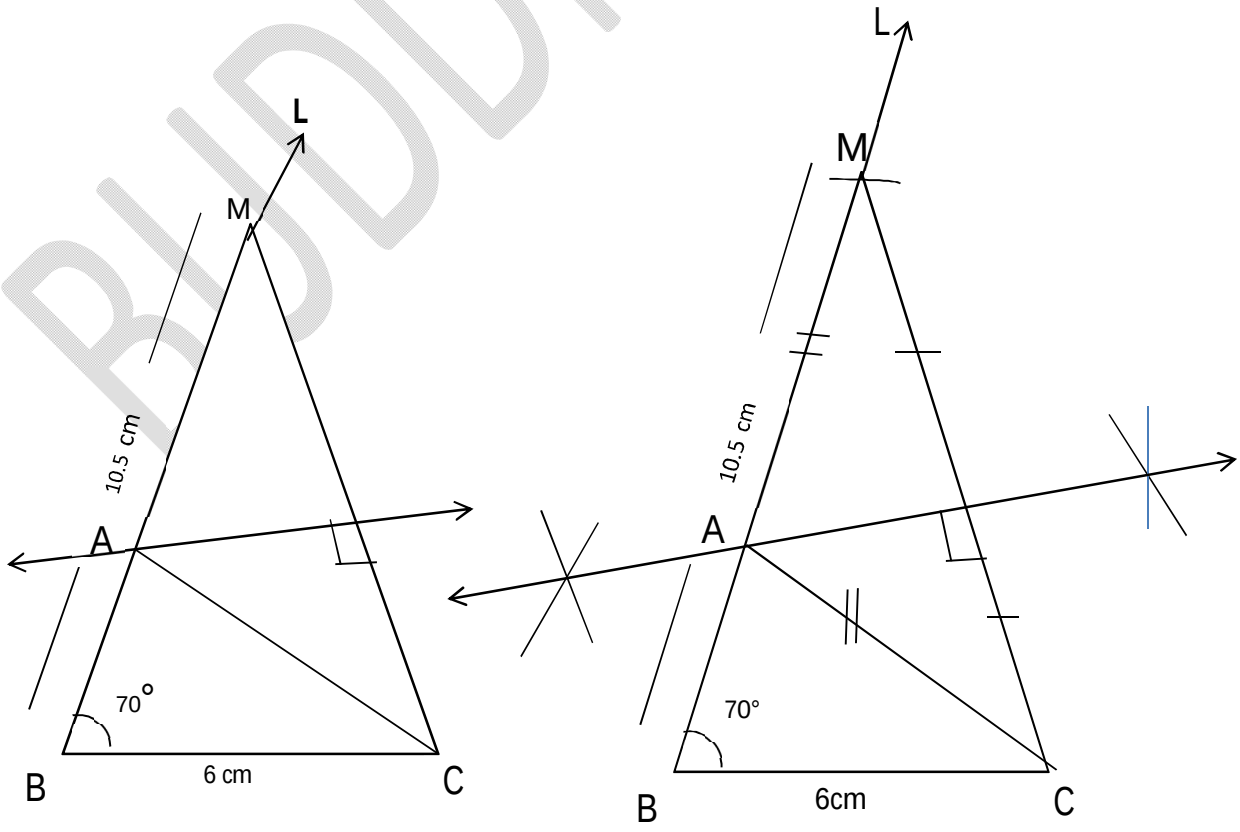
IV) Join points C and M

V) Draw perpendicular bisector of seg CM and let it

intersect ray BM . name the intersection point as Point A

VI) Draw seg AC.

Δ ABC is a required triangle



Q.4) Construct Δ BAD AD = 5.7cm, ∠BAD= 120°, and AB = 4.5 cm

Solution: As shown in the rough figure ,first we draw seg AD = 5.7 cm of length . on the ray making an angle of 120°

With seg AD, mark point B such that

AF = EA + ED = 4.5 cm

Now we have to locate point B on ray AF

AE + EB = EA + ED = 4.5 cm

EB= ED

Point B is on the perpendicular bisector of seg DB.

The point of intersection of ray AB and the

Perpendicular bisector of seg DB is point E

Steps of construction:

I) Draw seg AD of length 4.5 cm

II) Draw ray AF such that ∠BAD =120°

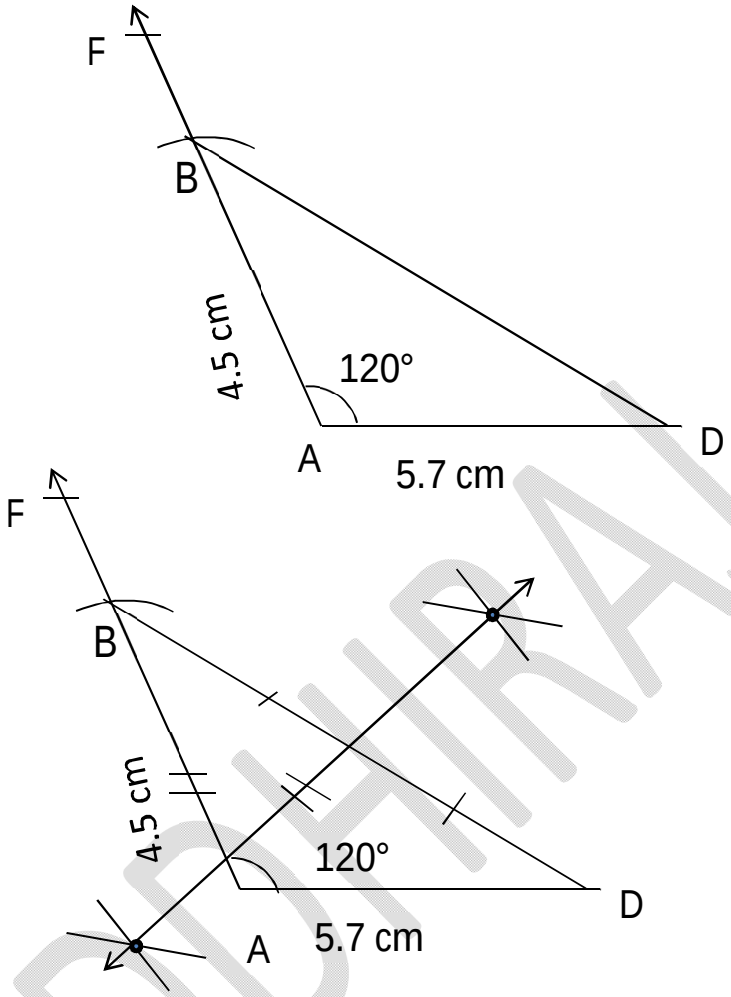
III) Mark point A on ray AF at 4.5 cm from point B.

IV) Join points D and B

V) Draw perpendicular bisector of seg BD and let it intersect ray AF . name the intersection point as Point E

VI) Draw seg ED.

Δ BAD is a required triangle



Q.5) Construct Δ GMB MB = 4.6cm, GM + BG = 8.2 cm And ∠m = 45°

Solution: As shown in the rough figure ,first we draw seg MB = 4.6 cm of length . on the ray making an angle of 45°

With seg MB, mark point G such that

MG = MC + CB = 8.2 cm

Now we have to locate point C on ray MG

MC + CG = MC + CB = 8.2 cm

CG= CB

Point C is on the perpendicular bisector of seg BG.

The point of intersection of ray MG and the

Perpendicular bisector of seg BG is point C

Steps of construction:

I) Draw seg MB of length 4.6 cm

II) Draw ray MD such that ∠m =45°

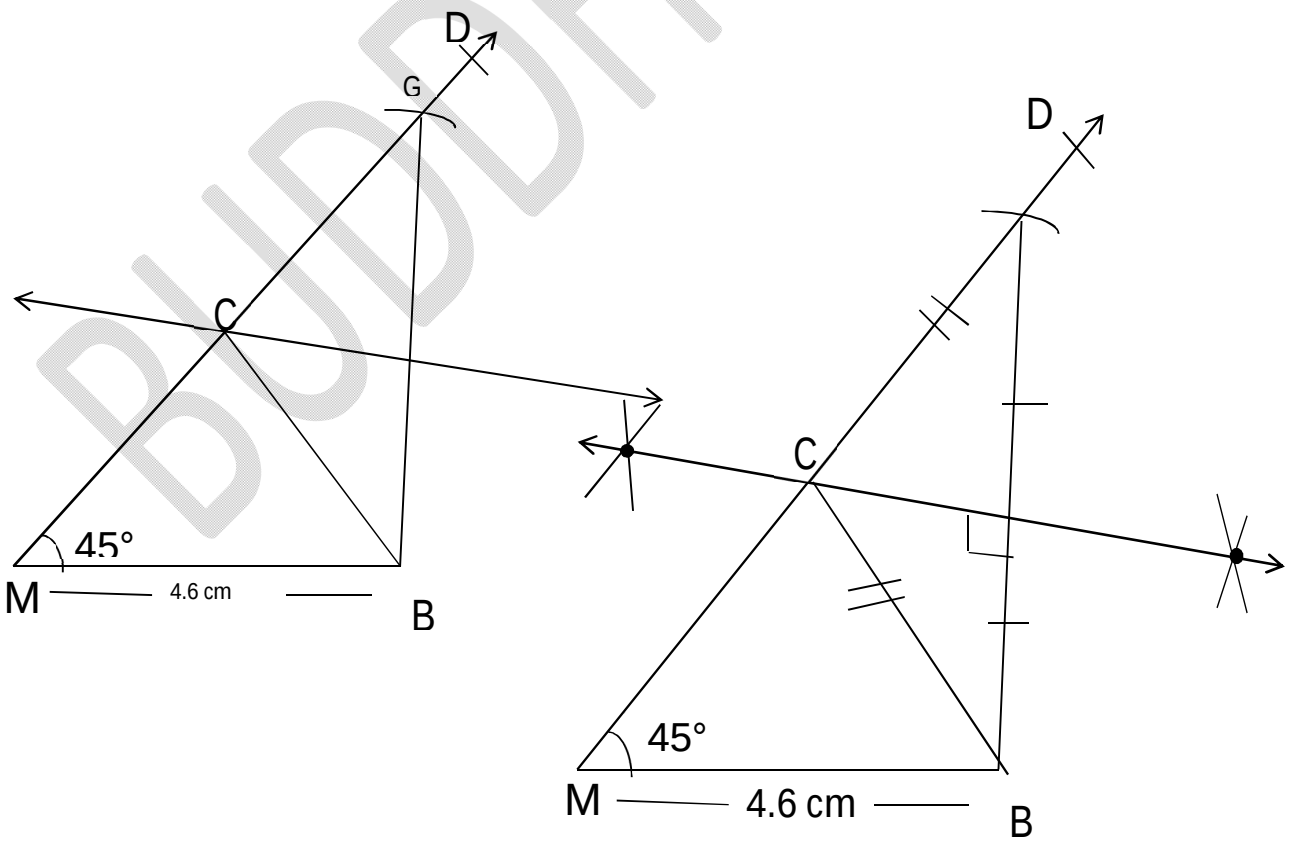
III) Mark point M on ray GM at 8.2 cm from point C.

IV) Join points B and G

V) Draw perpendicular bisector of seg BG and let it

intersect ray MD . name the intersection point as Point C

VI) Draw seg CB. \Δ GMB is a required triangle



Q.6) Construct Δ ABC in which BC = 3.2 cm, ∠ACB = 45° and perimeter of Δ ABC is 12 cm

Solution: Perimeter of Δ ABC = AB + BC + AC

12 = AB + 3.2 + AC

∴ AB + AC = 12 – 3.2

∴AB + AC = 9.8

In Δ ABC

BC = 3.2 cm, ∠ACB = 45° AB + AC = 9.8

As shown in the rough figure ,first we draw seg CB

= 3.2 cm of length . on the ray making an angle of 45°

With seg CB, mark point D such that

BD = AC + AB = 9.8 cm

Now we have to locate point A on ray BD

CA + CD = CA + CB = 9.8 cm

CD= CB

Point A is on the perpendicular bisector of seg BD.

The point of intersection of ray CD and the

Perpendicular bisector of seg BD is point A

Steps of construction:

I) Draw seg BC of length 3.2 cm

II) Draw ray CT such that ∠BCT =45°

III) Mark point D on ray CT such that l (C , D) =

6.8 cm

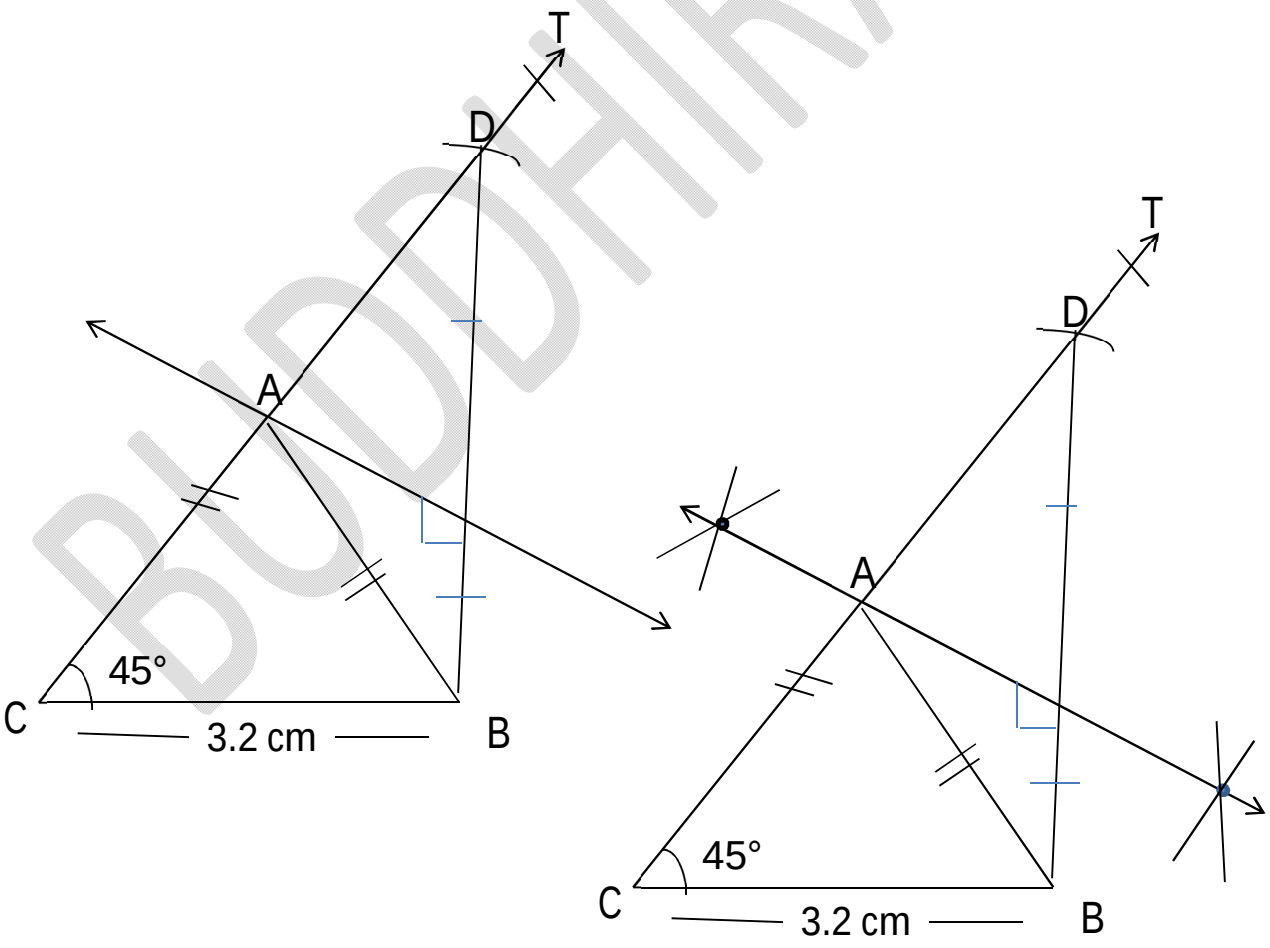
IV) Join points D and B

V) Draw perpendicular bisector of seg DB

Intersecting ray CT .Name the point as A.

VI) Join the point A and B

Hence Δ ABC is a required triangle



Q. 7) Construct Δ LMN, MN = 4.2 cm, ∠m = 78°, and ∠M + ∠N = 8.5 cm

Solution: As shown in the rough figure ,first we draw seg MN = 4.2 cm of length .on the ray making an angle of 78°

With seg MN, mark point K such that

MK = LM + LN = 8.5 cm

Now we have to locate point L on ray MK

ML + LK = ML + LN = 8.5 cm

LK = LN

Point L is on the perpendicular bisector of seg MK.

The point of intersection of ray MK and the

Perpendicular bisector of seg NK is point L.

In given MN = 4.2 cm, ∠m = 78°

Take Point K on ray MS such that

MK = LM + LK = 8.5 cm --------- i)

By theorem of perpendicular bisector of segmet,

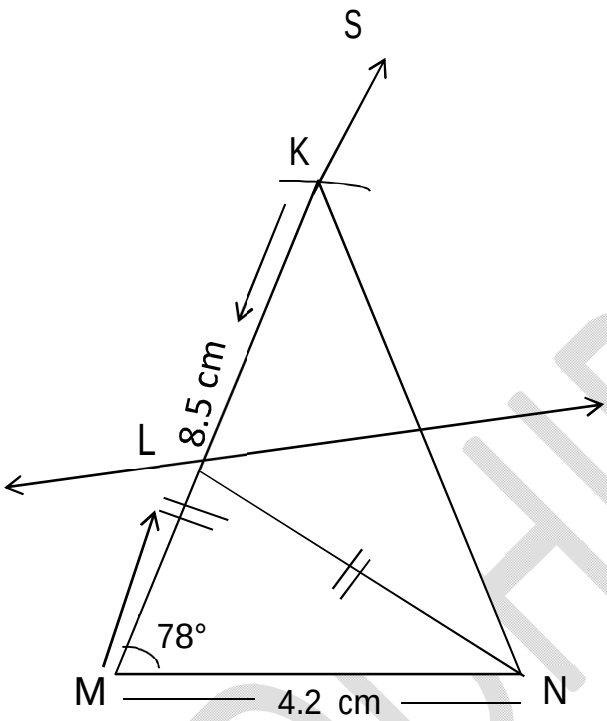
point L lies on perpendicular bisector of seg KN.

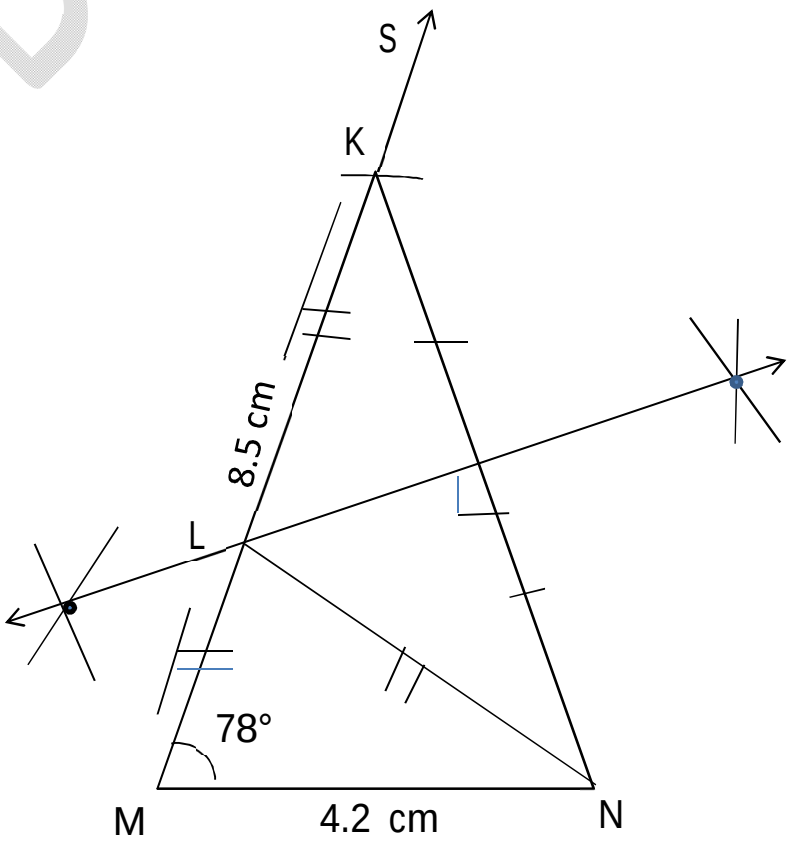
∴ KL = LN --------- II)

LM + LK = 8.5 cm From I)

LM + LN = 8.5 cm from II)

Δ LMN is required triangle.





Q.8) Construct Δ ABC, AC = 4.8 cm, ∠A = 70°, and AB + BC = 7 cm.

Solution: As shown in the rough figure ,first we draw seg AC = 4.8 cm of length .on the ray making an angle of 70°

With seg AC, mark point D such that

AQ = BA + BC = 7 cm

Now we have to locate point B on ray AQ

AB + BQ = AB + BC = 7 cm

BQ = BC

Point B is on the perpendicular bisector of seg CQ.

The point B of intersection of ray and the

Perpendicular bisector of seg CQ is point B

Given AC = 4.8 cm ,∠A = 70°

Take point Q on ray AP such that

AQ = BA + BQ = 7 cm --------- (I)

By theorem of perpendicular bisector of segment point A lies on perpendicular bisector of seg QC.

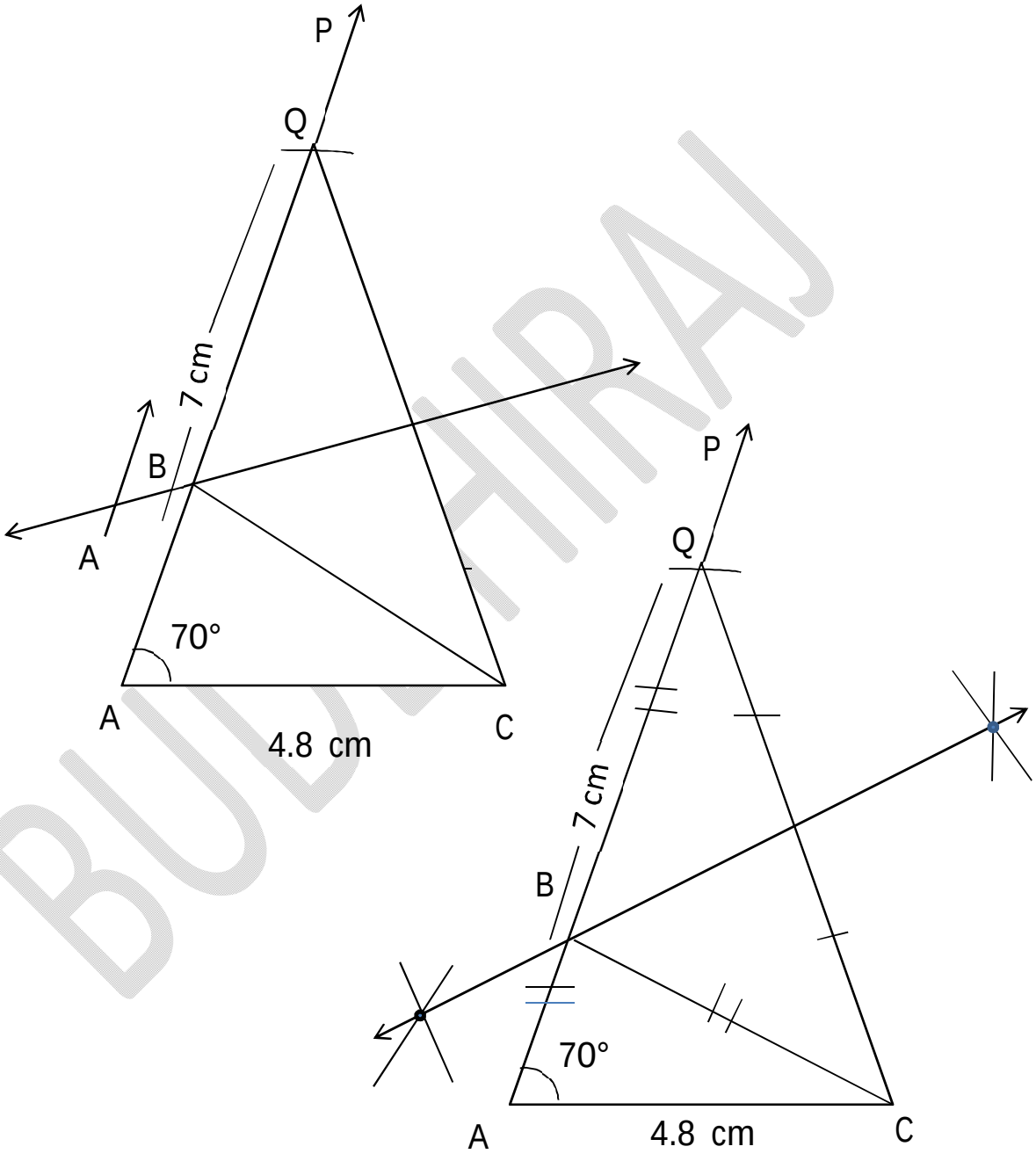
∴BQ = BC -------- (II)

Now AQ = 7 cm

BA + BQ = 7 cm ---------- (from I)

BA + BC = 7 cm ---------- (from II)

∴ ΔABC is required triangle.



Q.9) Construct Δ PQR, QR = 6.3 cm, ∠Q = 75°, and

PQ + PR = 9 cm.

Solution: As shown in the rough figure ,first we draw seg QR = 6.3 cm of length .on the ray making an angle of 75° With seg QR, mark point B such that

QB = PQ + PR = 9 cm

Now we have to locate point P on ray QB

QP + PB = QP + PR =9 cm

PB =PR

Point P is on the perpendicular bisector of seg RB.

The point of intersection of ray QB and the

Perpendicular bisector of seg RB is point P

Given QR = 6.3 cm ,∠Q = 75°

Take point B on ray QA such that

QB = PQ + PB = 9 cm --------- (I)

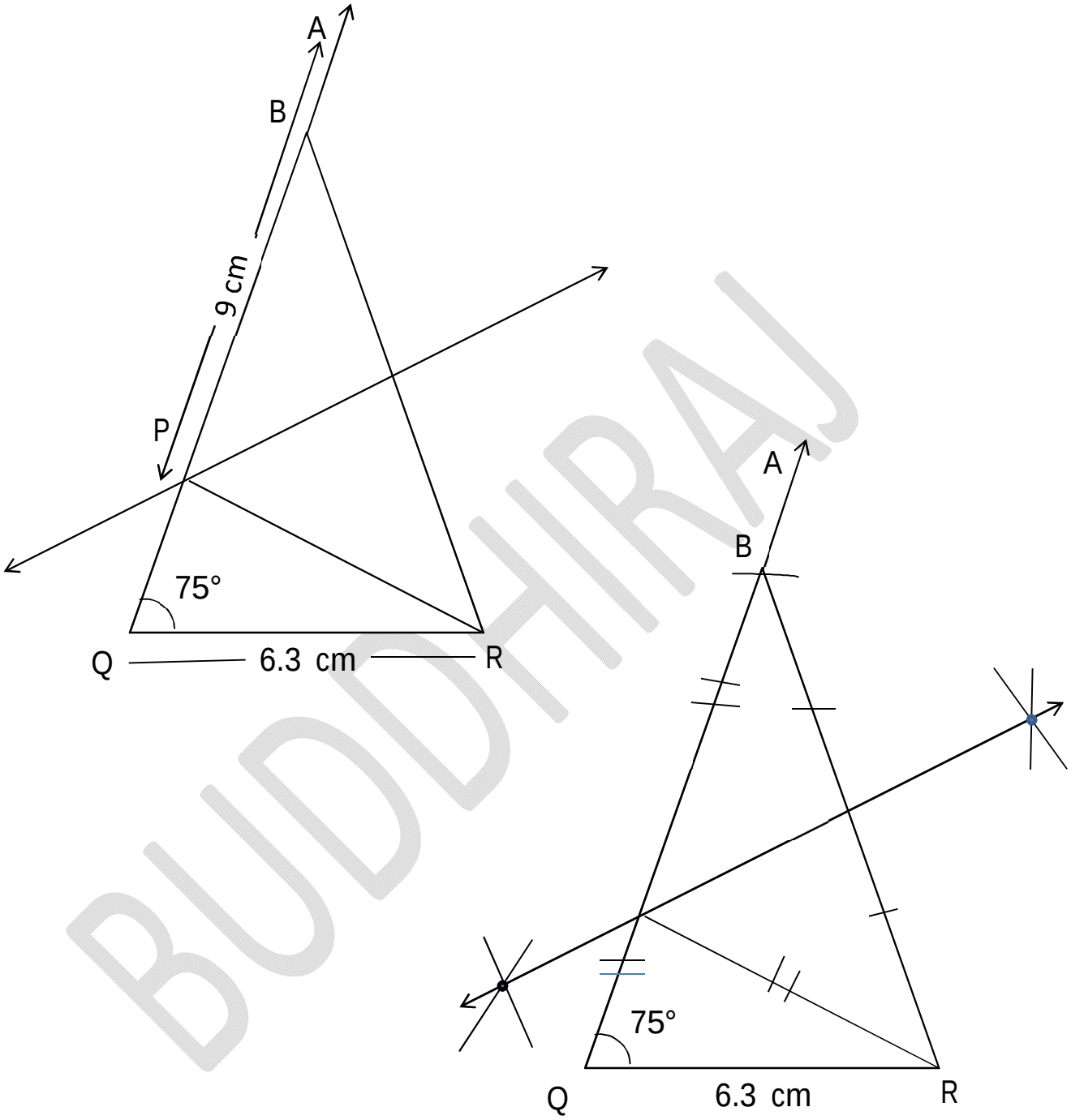
By theorem of perpendicular bisector of segment point P lies on perpendicular bisector of seg BR.

∴PB= BR -------- (II)

PQ + PB = 9 cm ---------- (from I)

PQ + PR = 9 cm ---------- (from II)

Δ PQR is required triangle.



Q.10) Construct Δ DEF, EF = 4.8 cm, ∠E = 50°, and

DE + DF = 8.3cm.

Solution: As shown in the rough figure ,first we draw seg EF

= 4.8 cm of length .on the ray making an angle of

50° With seg EF, mark point B such that

EB = DE + EF = 8.3 cm

Now we have to locate point D on ray EB

ED + DB = ED + DF = 8.3 cm

DB = DF

Point D is on the perpendicular bisector of seg FB.

The point of intersection of ray EB and the

Perpendicular bisector of seg FB is point D

Given EF = 4.8 cm ,$\angle E = 50°$

Take point B on ray EA such that

EB = DE + DB = 8.3cm --------- (I)

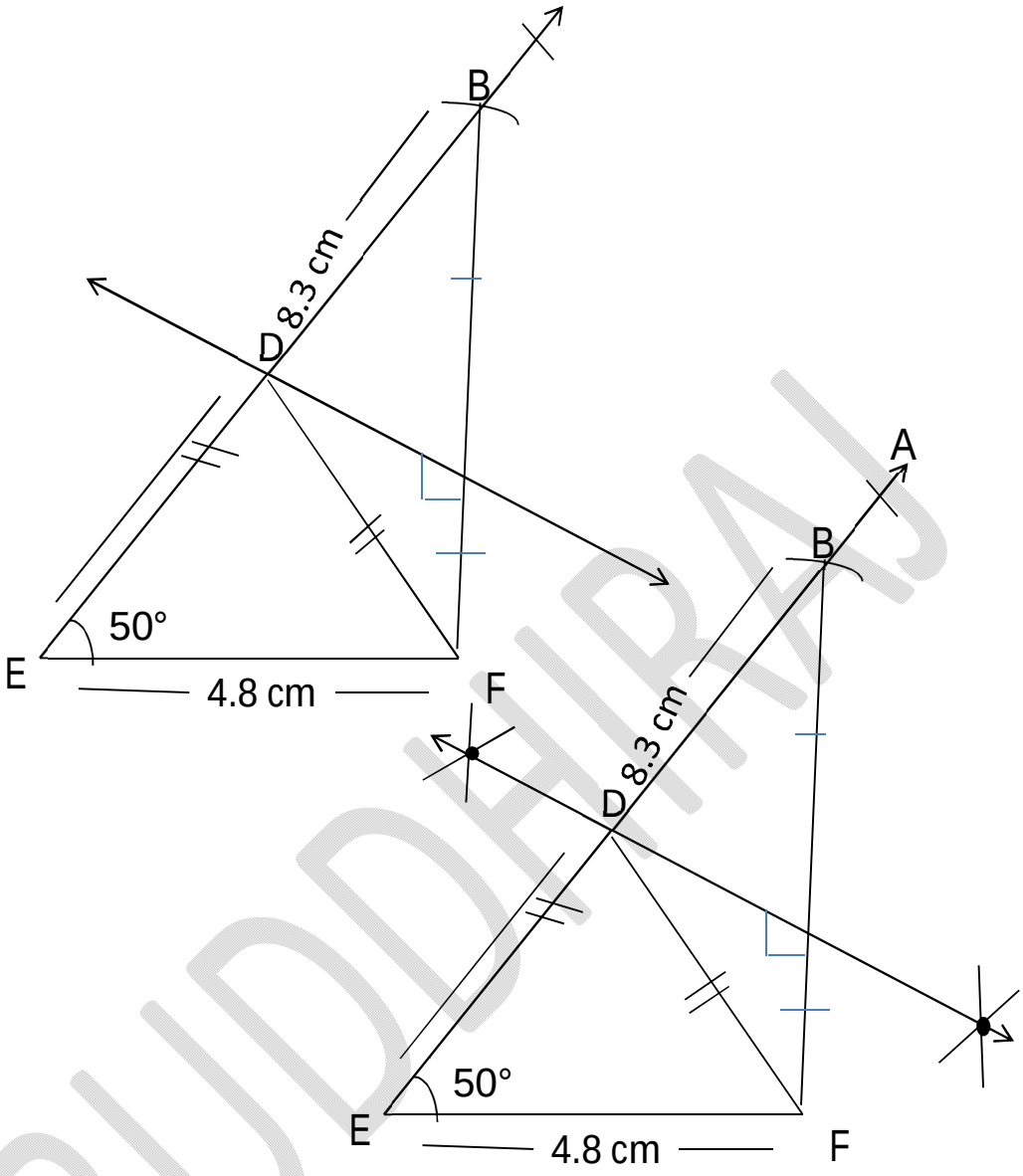
By theorem of perpendicular bisector of segment point D lies on perpendicular bisector of seg DB.

$\therefore$DB= DF -------- (II)

DE+ DB = 9 cm ---------- (from I)

DE + DF= 9 cm ---------- (from II)

$\therefore \Delta$DEF is required triangle



Q.11) Construct Δ LMN, MN = 8.5 cm, ∠LMN = 40°, and LM – LN = 3cm.construct Δ LMN.

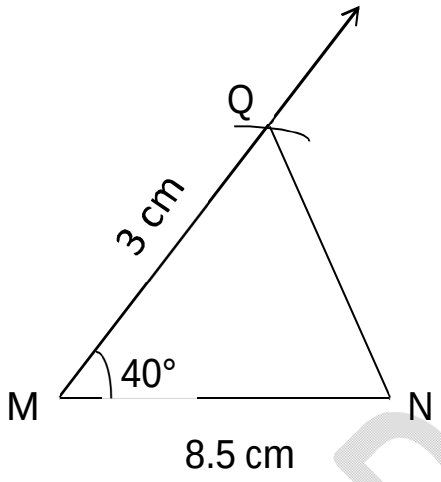
Solution: LM – LN = 3 cm

LM > LN.

First draw seg MN of 8.5 cm

We can draw ray MP such that ∠NMP = 40°take

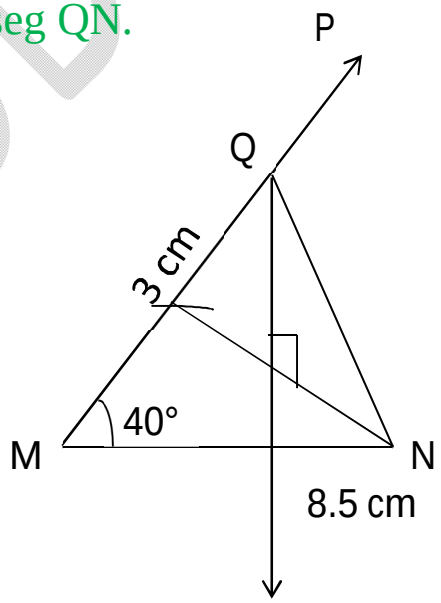
Point Q on ray MP such that MQ ≅ 3 cm join Q and N



Now, LM – LN = 3 cm

Point L is on the perpendicular bisector of seg QN.

Point L is the point of intersection of ray MP and the perpendicular bisector of seg QN.



∠Q = ∠N -------- (I)

Now, MQ = 3 cm

LM – LQ = 3 cm

LM – LN = 3 cm ---------- (from I)

ΔLMN is required triangle. MN = 8.5 cm

∠LMN = 40° and LM – LN = 3 cm

Steps of construction:

I) Draw seg MN of length 8.5 cm

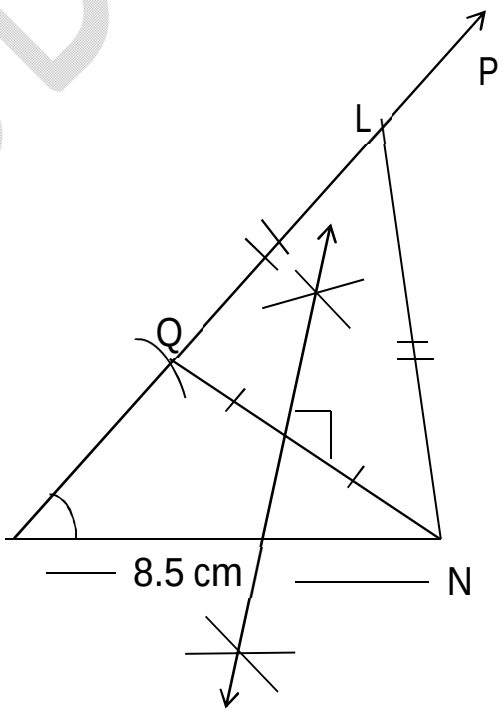
II) Draw ray MP such that ∠PMN =40°

III)Draw on arc on ray MP of radius 3 cm and name it as Point Q

IV) Draw QN

V) Draw perpendicular bisector of NQ name the Point L where it intersects ray MP

VI) Join LN.



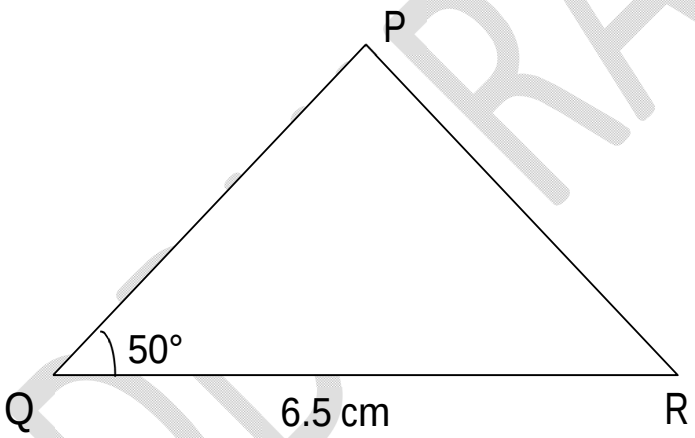
Q.12) Construct Δ PQR, QR = 6.5 cm, ∠Q = 50°, and PQ – PR = 3cm.

Solution: PQ – PR = 3 cm

PQ > PR

First draw seg QR of 6.5 cm

We can draw ray QT such that ∠TQR = 50°



Point T is on ray RQ. Take point D on opposite ray of Ray QT such that

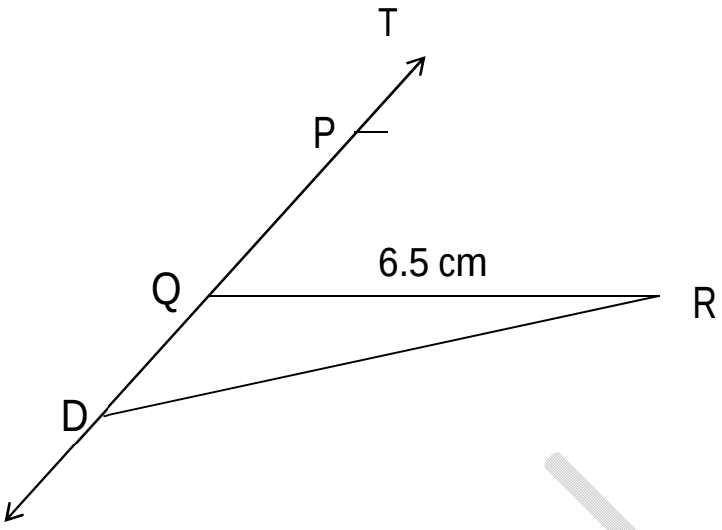
QD = 3 cm

Now, PD = PQ + QD = PQ + 3 = PR

(∴ PQ – PR = 3 cm)

∴ PD = PR

∴Point P is on the perpendicular bisector of seg RD.



Steps of construction:

I) Draw seg QR of length 6.5 cm

II) Draw ray QT such that ∠Q =50°

III)Take Point D on the opposite ray QS of ray QT

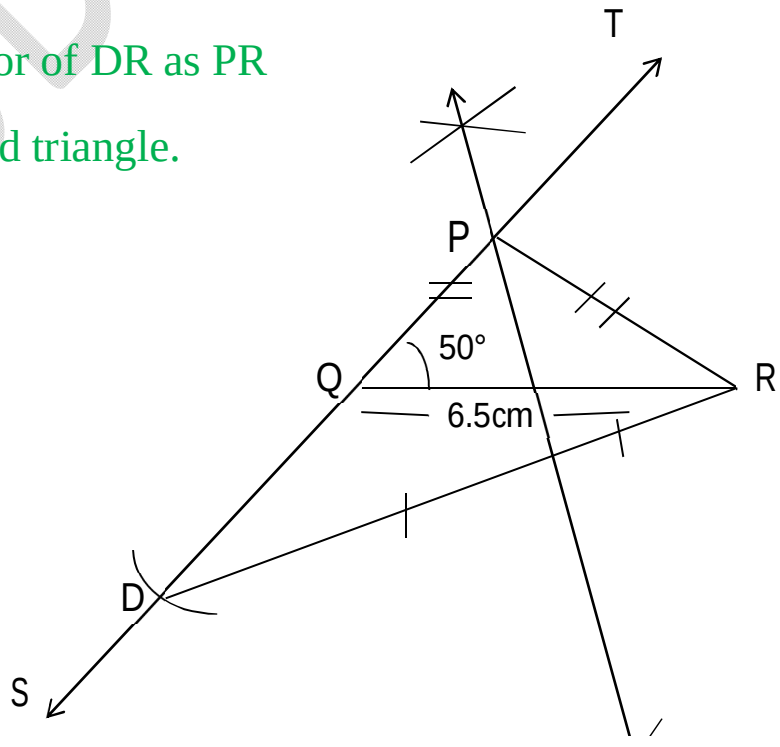
Such that QD = 3 cm

IV) Construct perpendicular bisector of seg DR

V) Name the point of intersection of ray QT and the

Perpendicular bisector of DR as PR

Δ PQR is the required triangle.



Q.13) Construct Δ PQR, QR = 6 cm, ∠Q = 40°, and

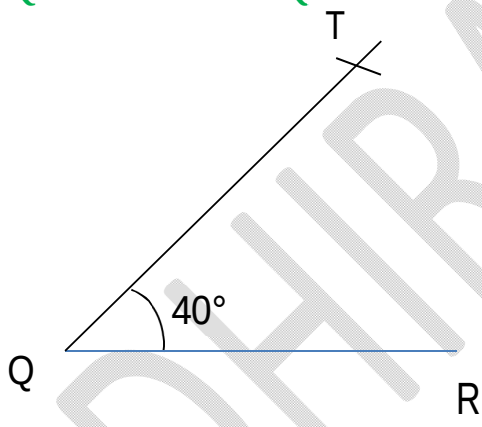
PR – PQ = 2 cm.

Solution : PR – PQ = 2 cm.

PR > RQ

First draw seg. QR of 6 cm

We can draw ray QT such that ∠Q = 40°



Point P is on ray QT Take point S on opposite ray of

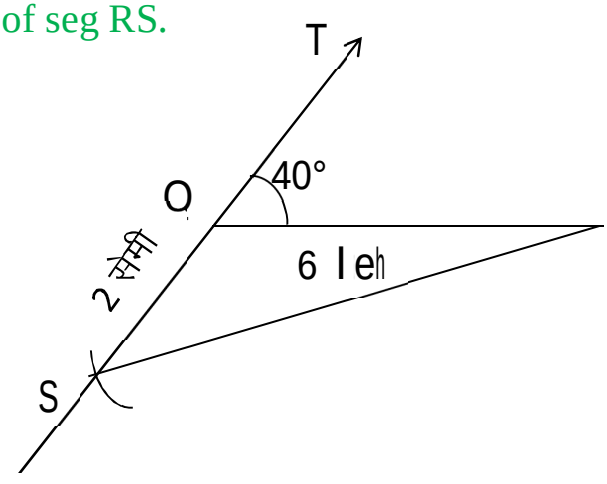
ray QT such that.

QS = 2cm

Now, PS = PQ + QD = PQ +2= PR

(∴ PR – PQ = 2 cm) ∴ PS = PR

Point P is on the perpendicular bisector of seg RS.



Steps of construction:

I) Draw QR of length 6 cm

II) Draw ray QT such that ∠RQT =40°

III)Take point Q on the opposite ray QX of ray QT

Such that QS = 2 cm

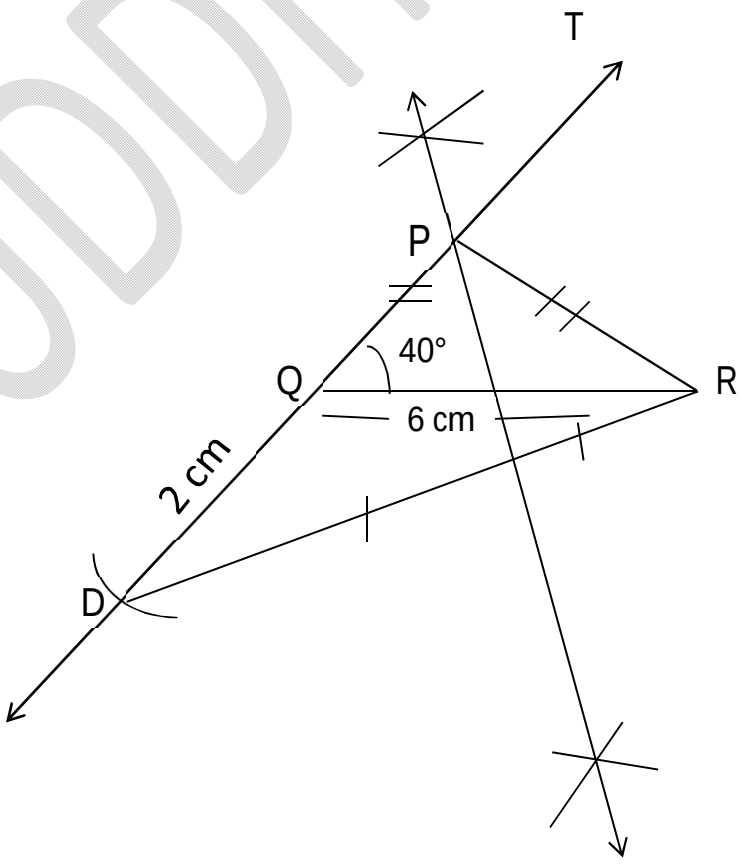
IV) construct perpendicular bisector of seg QR

V) Name the point of intersection of ray QT and

Perpendicular bisector of SR as P

V) Draw seg PR.

Δ PQR is required triangle.



Q.14) Construct Δ ABC, BC = 6 .5cm, ∠ABC = 45°, and AC – AB = 2.5 cm.

Solution : BC = 6.5 cm, AC – AB = 2.5 cm.

AC > AB

First we draw the length of seg 6.5 cm and

∠ ABC = 45°

Draw opposite ray of ray BX ,take point y and

BY = 2.5 cm join point y and c.

Now, Point A is on the perpendicular bisector of seg AC

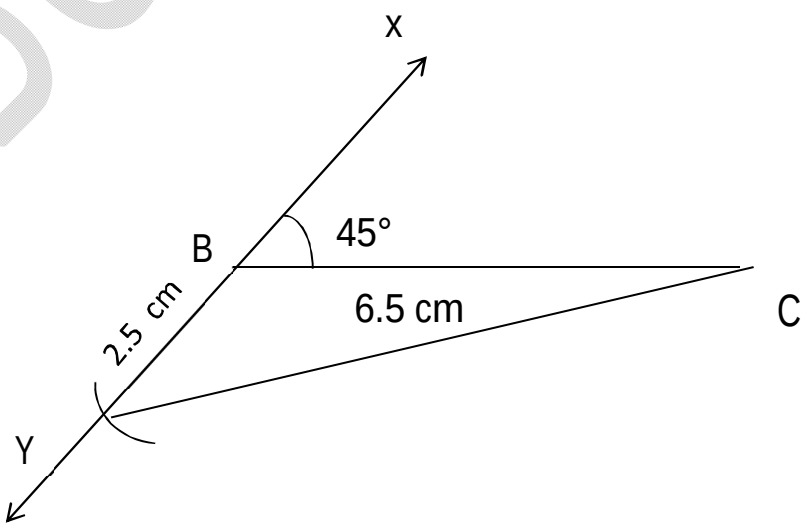
∴ Point A is the point of intersection of ray BX and the

Perpendicular bisector of seg AC.

AY = AC --------- (I)

Now, AY – AB = 2.5 cm

AC – AB = 2.5 cm (From I)



Steps of construction:

I) Draw BC of length 6.5 cm

II) Draw ray BX, ∠CBX =45°

III)Draw BY of opposite ray of ray BX.

Such that BY= 2.5 cm

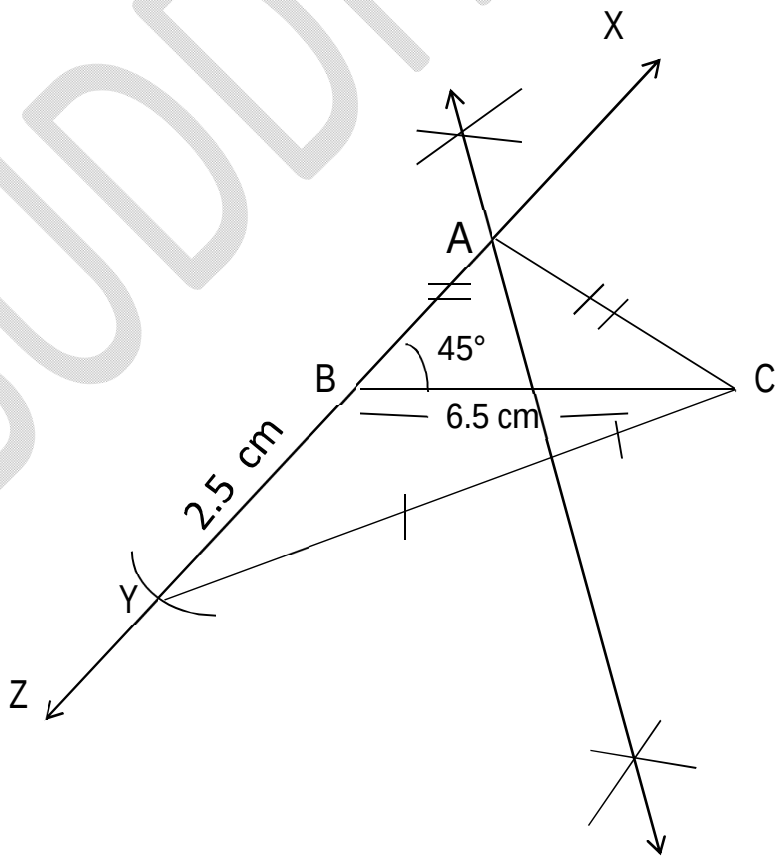
IV) Construct perpendicular bisector of seg YC.

V) Name the point of intersection of ray BX and the

Perpendicular bisector of YC as A

VI) Join point A and C

Δ ABC is the required triangle.



Q.15) Construct Δ RST ,ST = 7.2 cm, ∠RST = 85°, and RS – RT = 3.5 cm.

Solution : ST = 7.2 cm, RS – RT = 3.5 cm. RS > RT

First we draw the length of seg 7.2 cm and

∠ RST = 85°

Draw opposite ray of ray SA ,take point B and

SB = 3.5 cm join point y and T.

Now, Point R is on the perpendicular bisector of seg RT

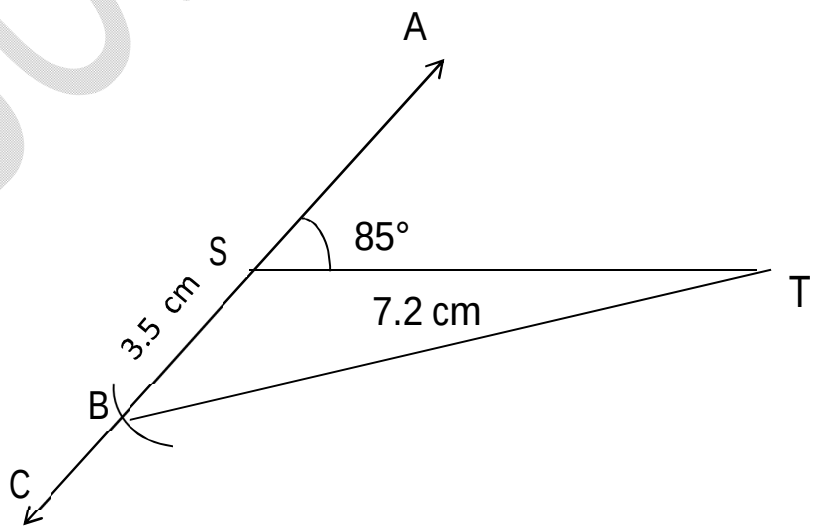
∴ Point A is the point of intersection of ray SA and the

Perpendicular bisector of seg RT

RB = RT ---------- (I)

Now, RB – RS = 3.5 cm

RT – RS = 3.5 cm (From I)



Steps of construction:

I) Draw ST of length 7.2 cm

II) Draw ray ST, ∠S =85°

III)Draw SC of opposite ray of ray SA.

Such that SB= 3.5 cm

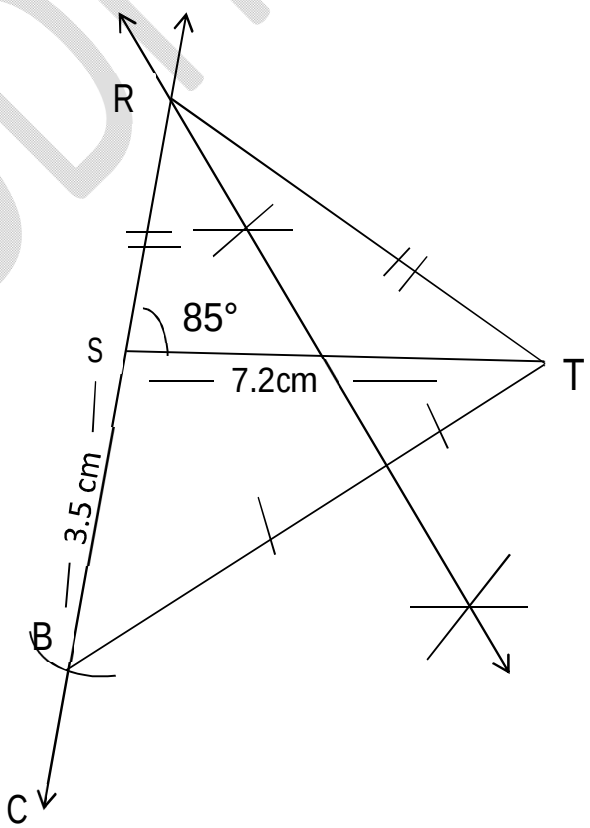
IV) Construct perpendicular bisector of seg BT.

V) Name the point of intersection of ray SA and the

Perpendicular bisector of BT as R

VI) Draw seg RT

Δ RST is the required triangle.



Q.16) Construct Δ KSL ,SL = 6 cm, ∠S = 55°, and

KL – KS = 2.2 cm.

Solution : SL = 6 cm, KL – KS= 2.2 cm. KL > KS

First we draw the length of seg SL 6 cm and

∠ S= 55°

Draw opposite ray of ray SP ,take point Q and

SQ = 2 cm join point Q and L.

Now, Point K is on the perpendicular bisector of seg KL

∴ Point KS is the point of intersection of ray SP and the

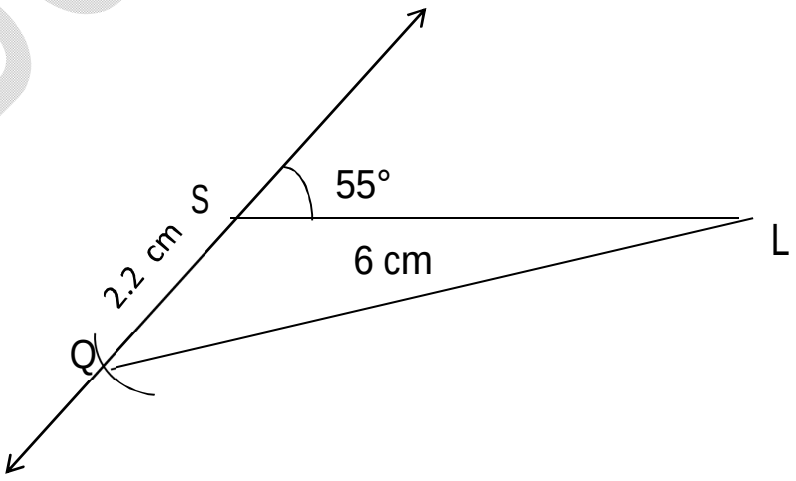
Perpendicular bisector of seg SP

KS = KL ---------- (I)

Now, SQ = 2.2 cm

KQ – KS = 2.2 cm

KL – KS = 2.2 cm (From I)



Steps of construction:

I) Draw SL of length 6 cm

II) Draw ray SP, ∠S =55°

III)Draw SR of opposite ray of ray SP.

Such that SQ= 2.2 cm

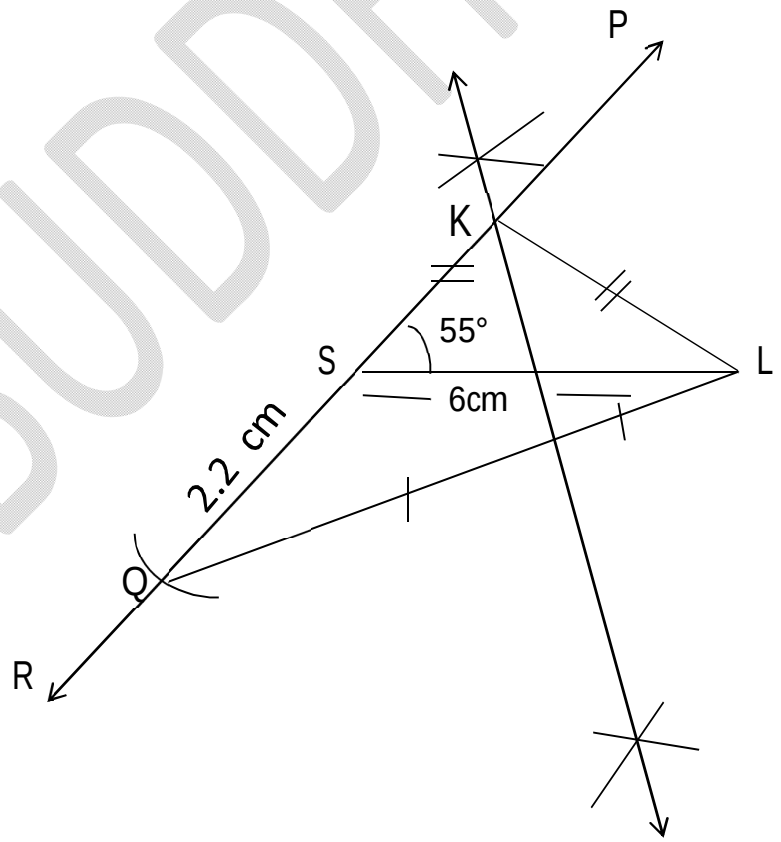
IV) Construct perpendicular bisector of seg QL.

V) Name the point of intersection of ray SP and the

Perpendicular bisector of QL as K

VI) Draw seg KL

Δ KSL is the required triangle



Q.17) Construct Δ RMN ,RM= 6 cm, ∠NRM = 70°, and

RN– MN = 2.8cm.

Solution : RM = 6 cm, RN – MN= 2.8 cm.RN > MN

First we draw the length of seg RM= 6 cm and

∠ R= 70°

Draw opposite ray of ray RA ,take point B and

RB = 2.8 cm join point B and M.

Now, Point N is on the perpendicular bisector of seg NM

∴ Point R is the point of intersection of ray RA and the

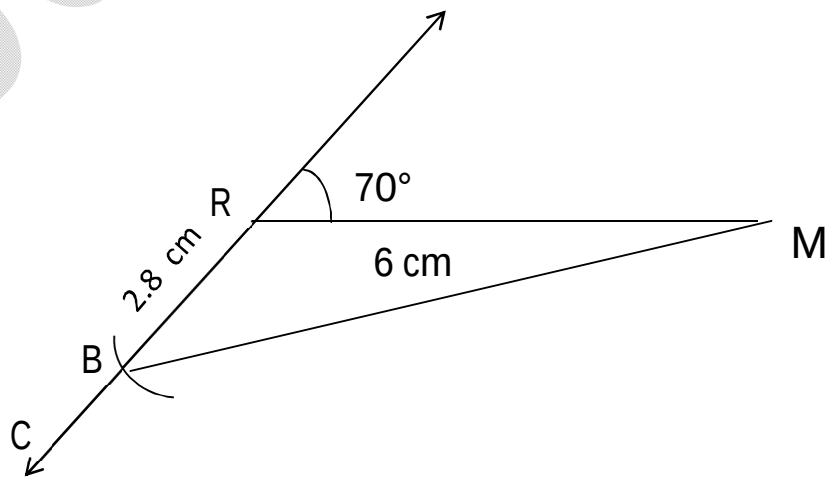
Perpendicular bisector of seg NM.

NB = NM ---------- (I)

Now, RB = 2.8 cm

NB – NR = 2.8 cm

NM – NR = 2.8 cm (From I)



Steps of construction:

I) Draw RM of length 6 cm

II) Draw ray RA ,such that ∠NRM =70°

III)Take point RC on the opposite ray RA if ray such

That RB = 2.8 cm

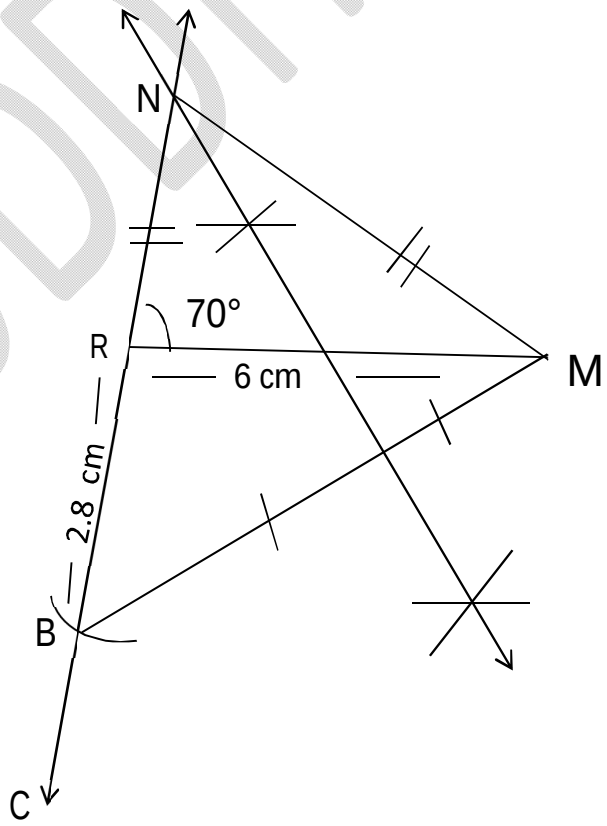
IV) Construct perpendicular bisector of seg BM.

V) Name the point of intersection of ray RA and the

Perpendicular bisector of BM as N

VI) Draw seg NM

Δ RMN is the required triangle



Q.18) Construct Δ PQR ,QR= 5.5 cm,and ∠ACB = 48°, and Perimeter of triangle is 12 cm.

Solution: QR = 5.5 cm

Perimeter of Δ PQR= 12 cm

PQ + QR + PR = 12

PQ + PR = 12 – 5.5 cm

PQ + PR = 6.5 cm

Sum of any two sides of a triangle must be greater than its third side.

∴ Δ PQR with this measurement is not possible.

Q.19) Construct Δ ABC ,AB= 5.8 cm, ∠BAC = 105°, and AC– BC = 2.9 cm.

Solution : AB= 5.8 cm, AC – BC= 2.9 cm. AC > BC

First we draw the length of seg AB= 6 cm and ∠BAC= 105°

Draw opposite ray of ray AT ,take point S and AS = 2.9 cm join point S and B.

Now, Point C is on the perpendicular bisector of seg CB

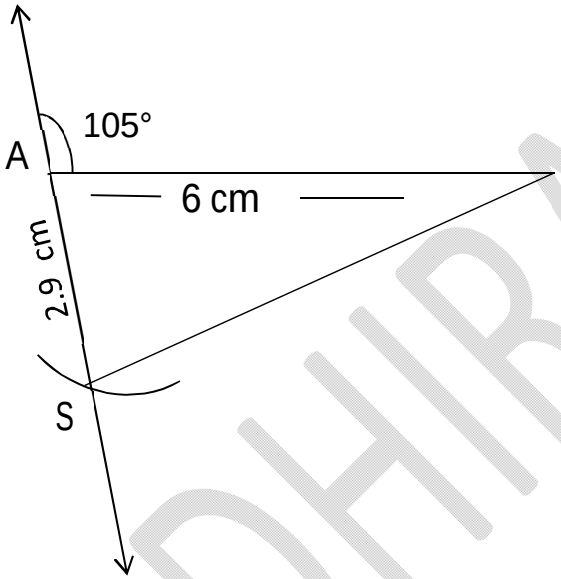
∴ Point A is the point of intersection of ray AT and the Perpendicular bisector of seg CB.

CS = C**B** ---------- (I)

Now, AS = 2.9 cm

CS – CA = 2.9 cm

CB – CA = 2.9 cm (From I)



Steps of construction:

I) Draw AB of length 5.8 cm

II) Draw ray RA ,such that ∠BAC =105°

III)Take point AX on the opposite ray AT of ray such

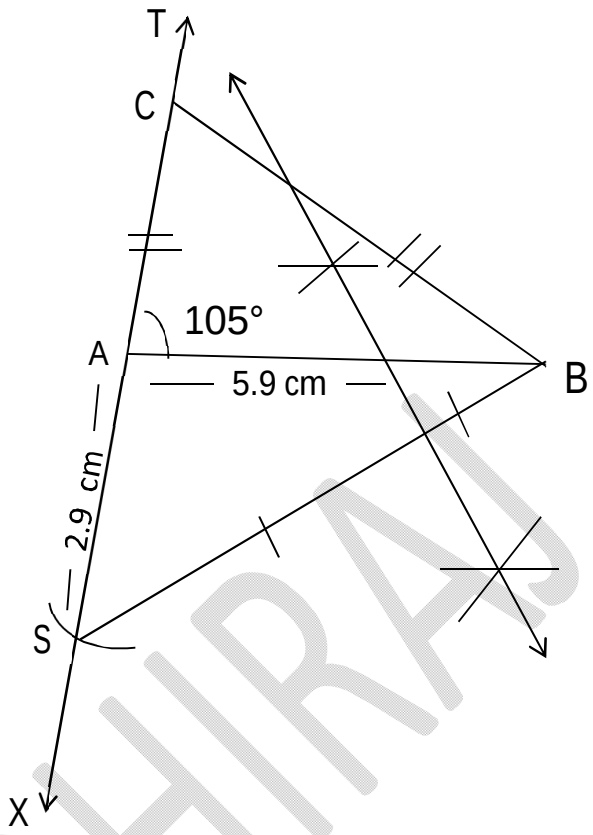
That SA= 2.9 cm

IV) Construct perpendicular bisector of seg SB.

V) Name the point of intersection of ray AT and the

Perpendicular bisector of SB as C

VI) Draw seg CB



Q.20) Construct Δ PQR , ∠Q = 70°, ∠R = 50°, and

PQ + QR + RP = 10 cm.

Solution: In this construction. Instead of length of each side

Perimeter of the triangle is given.

First draw ST having length equal to perimeter of

Δ PQR

Points Q and R must be on seg ST such that S-Q-R-T

To locate point P, we have to draw Δ PQS

Such that PR = RT

PR =RT, point R must be perpendicular bisector of Seg PT

Similarly ,PR =RT ,point R must be perpendicular bisector of seg PT.

∠PQR is an exterior angle Δ PQS and ∠PRG is an Exterior angle of ΔPRT.

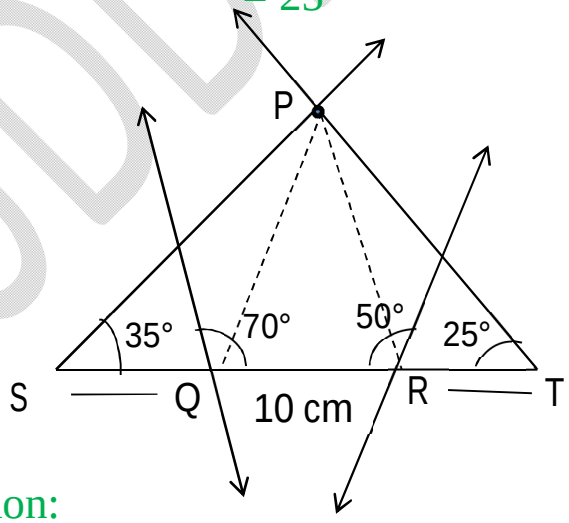
∴ By theorem of remote interior angle of a triangle.

∠ PQR = 2 ∠S and ∠ PRQ = 2 ∠T

∴ $\angle S = \frac{1}{2} \angle PQR$ ∴ $\angle T = \frac{1}{2} \angle PRQ$

∴ $\angle S = \frac{1}{2} \times 70°$ ∴ $\angle T = \frac{1}{2} \times 50°$

= 35° = 25°



Steps of construction:

I) Draw seg ST of 10 cm

II) Draw a ray making an angle of 35° at point S

III) Draw a ray making an angle of 25° at point T

IV) Name the point of intersection of the two rays As P.

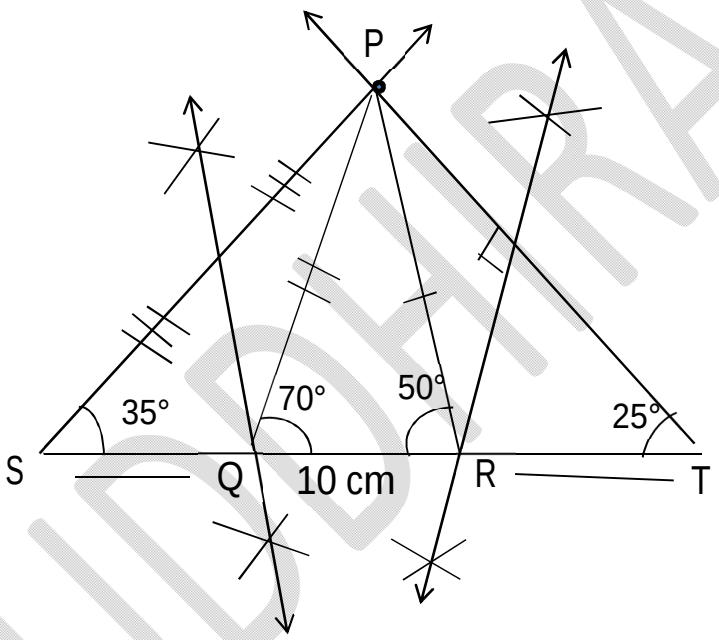
V) Draw the perpendicular bisectors of seg PS and

Seg PT. Name the points as Q and R respectively,

where the perpendicular bisector intersect line ST

VI) Draw seg PQ and seg PR

Δ PQR is the required triangle.



Q.21) Construct Δ ABC , ∠B = 70°, ∠C = 50°, and

AB + BC + AC = 11.3 cm.

Solution: In this construction ,instead length of each side,

Perimeter of the triangle is given.

First draw seg XY having length equal to

Perimeter of Δ ABC

Points B and C must be on seg XY such that X-B-C-Y

To locate point A, we have to draw Δ ABX such that

AB = BX and ∠ ACT such that AC = CT

Simillarly , for AB = BX and point B must be on

Perpendicular of seg AX

∠ABC is an exterior angle of ΔAYB and ∠ACB is an

Exterior angle of ΔACT

∴By theorem of remote interior angle of a triangle.

∠ ABC = 2 ∠X and ∠ ACB = 2 ∠Y

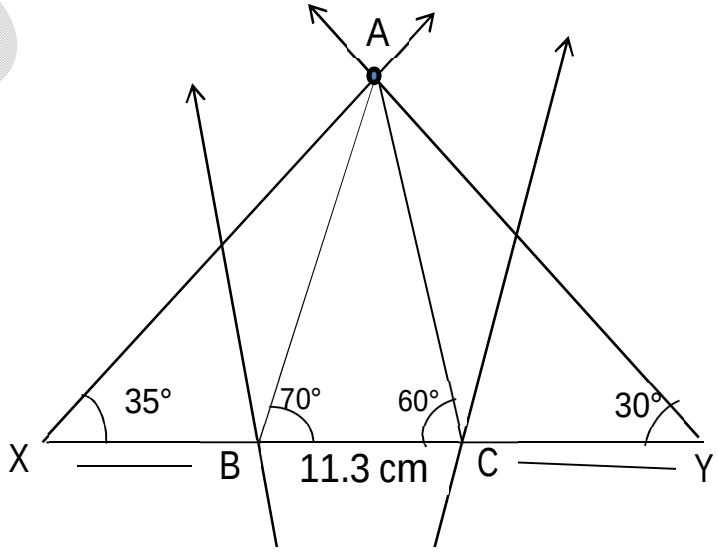
$\therefore \angle X = \frac{1}{2} \angle ABC \therefore \angle Y = \frac{1}{2} \angle ACB$

$\therefore \angle X = \frac{1}{2} \times 70° \qquad \therefore \angle Y = \frac{1}{2} \times 60°$

∠X = 35° ∴ ∠Y = 30°

We can construct Δ AXY such XY = 11.3 cm

∠X = 35° ∠Y = 30°



Steps of construction:

I) Draw seg XY of 11.3 cm

II) Draw a ray making an angle of 35° at point X

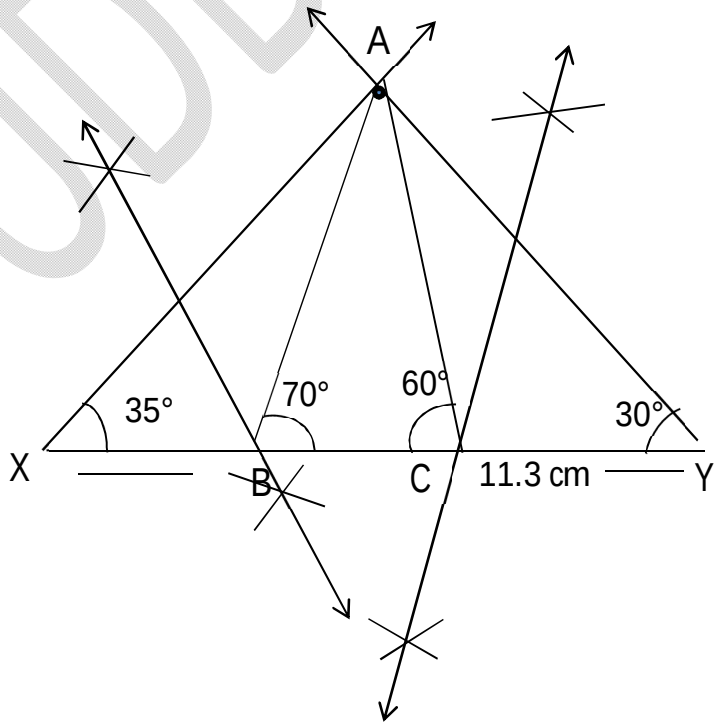
III) Draw a ray making an angle of 30° at point Y

IV) Name the point of intersection of the two rays As A.

V) Draw the perpendicular bisectors of seg AX and Seg AY. Name the points as B and C respectively, where the perpendicular bisector intersect line XY

VI) Draw seg AB and seg AC

Δ ABC is the required triangle.



Q.22) Construct Δ LMN , ∠M= 80°, ∠N = 48°, and

LM + MN + NL =9 cm.

Solution: In this construction ,instead length of each side,

Perimeter of the triangle is given.

First draw seg AB having length equal to

Perimeter of Δ LMN

Points M and N must be on seg AB such that A-M-N-B

To locate point L, we have to draw Δ LMA such that

AB = BX and ∠ ACT such that LN = NB

LM = MA and point M must be on perpendicular

bisector of seg LB

Similarly

∠LMN is an exterior angle of ΔLMA and ∠LNM is an

Exterior angle of ΔLNB

∴By theorem of remote interior angle of a triangle.

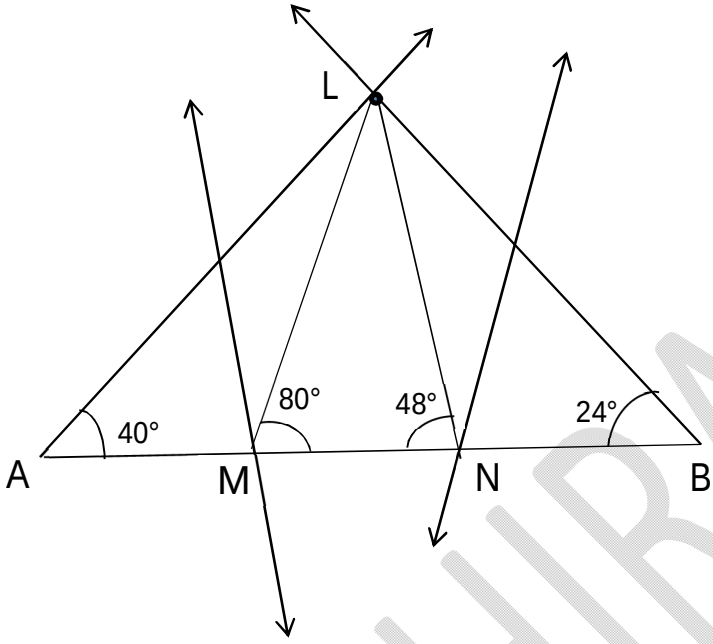
∠ LMN = 2 ∠A and ∠ LNM = 2 ∠B

$\therefore \angle A = \frac{1}{2}\angle LMN \therefore \angle B = \frac{1}{2}\angle LNM$

$\therefore \angle A = \frac{1}{2} \times 80°$ $\therefore \angle B = \frac{1}{2} \times 48°$

∠A = 40° ∴ ∠B = 24°

We can construct Δ LAB such ∠A = 40° ∠B = 24°



Steps of construction:

I) Draw seg AB of 9 cm

II) Draw a ray making an angle of A at 40°

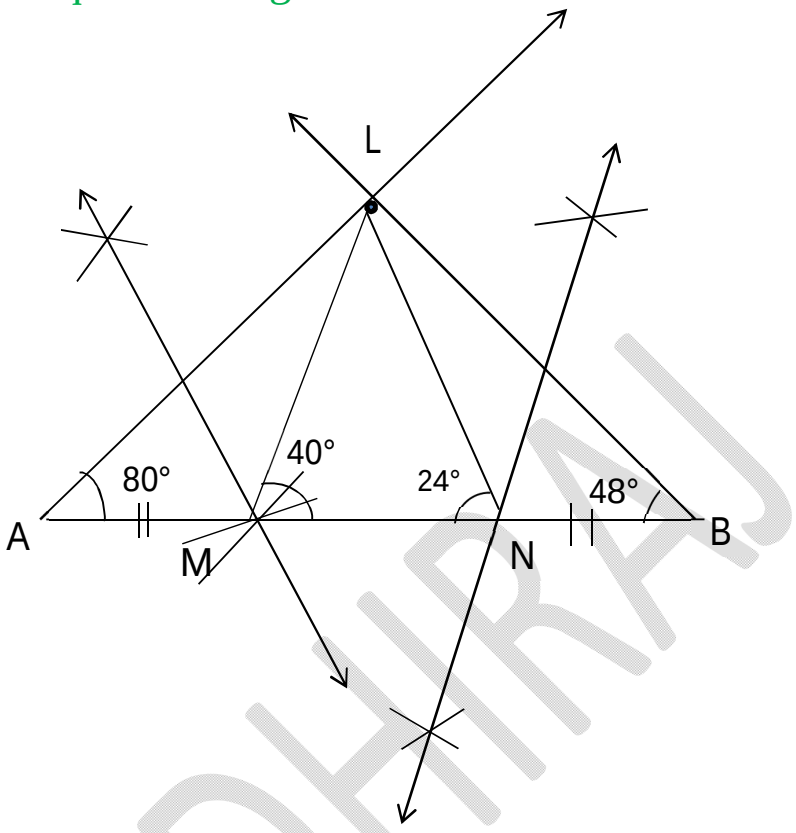
III) Draw a ray making an angle of B at 24°

IV) Name the point of intersection of the two rays As AL and BL

V) Draw the perpendicular bisectors of seg LA and Seg LB. Name the points as M and N respectively, where the perpendicular bisector intersect line

VI) Draw seg LM and seg LN

Δ LMN is the required triangle.



Q.23) Construct Δ ABC, ∠B= 70°, ∠C = 50°, and Perimeter of triangle is 12 cm

Solution: First draw seg DE is 12 cm

∠B= 70°, and ∠C = 50°,

∠ABC is an exterior angle of Δ ADB and

∠ACB is an exterior angle of Δ ACE

∴ By theorem of remote interior angle of triangle

∠ ABC = 2 ∠D and ∠ ACB = 2 ∠E

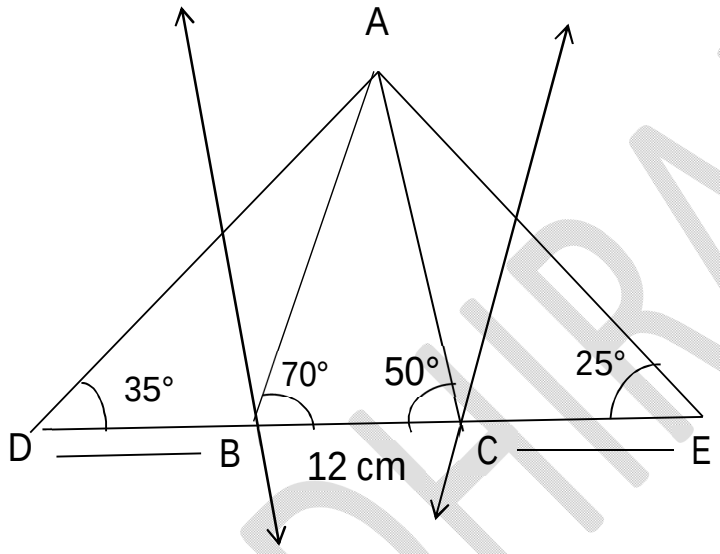
∴ $\angle D = \frac{1}{2}\angle ABC$ ∴ $\angle E = \frac{1}{2}\angle ACB$

$\therefore \angle D = \frac{1}{2} \times 70°$ $\therefore \angle E = \frac{1}{2} \times 50°$

$\angle D = 35°$ $\therefore \angle E = 25°$

We can construct Δ ADE such that DE = 12 cm

$\angle D = 35°$, $\angle E = 25°$



Steps of construction:

I) Draw seg AB of 12 cm

II) Draw a ray making an angle of 35° at point D

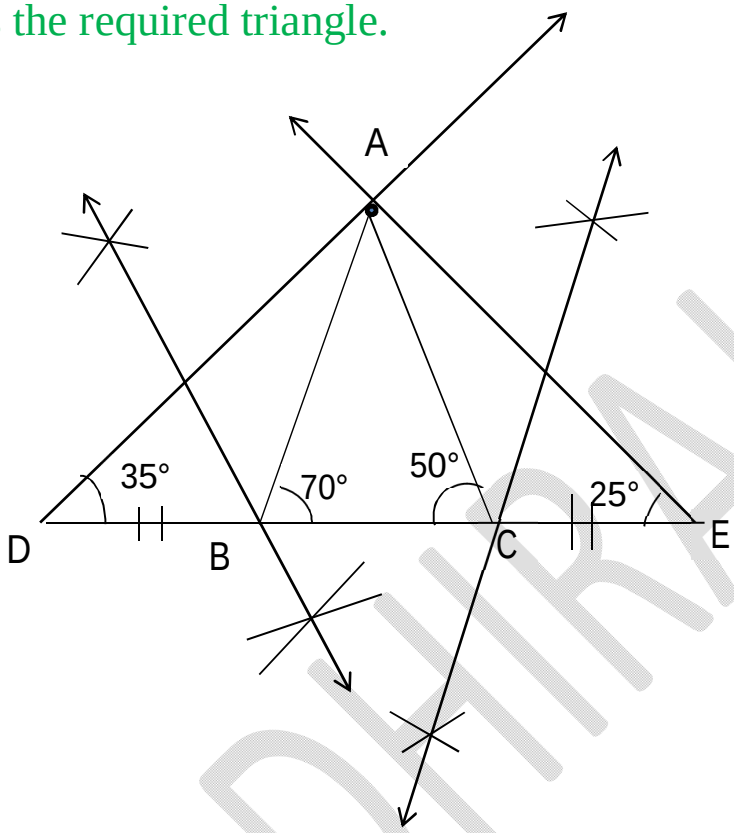
III) Draw a ray making an angle of 25° at point E

IV) Name the point of intersection of the two rays As A

V) Draw the perpendicular bisectors of seg AD and Seg AE. Name the points as B and C respectively, where the perpendicular bisector intersect line DE

VI) Draw seg AB and seg DE

Δ ABC is the required triangle.



Q.24) Construct Δ LMN, base of each angle is 80° then Perimeter of triangle is 11 cm.

Solution: First draw seg PQ is 11 cm

Base of each angle = MN is 80°

Means M = 40°and N = 40°

∠LMN is an exterior angle of Δ LPM and

∠LNM is an exterior angle of Δ LNQ

∴ By theorem of remote interior angle of triangle

∠ LMN = 2 ∠P and ∠ LNM = 2 ∠Q

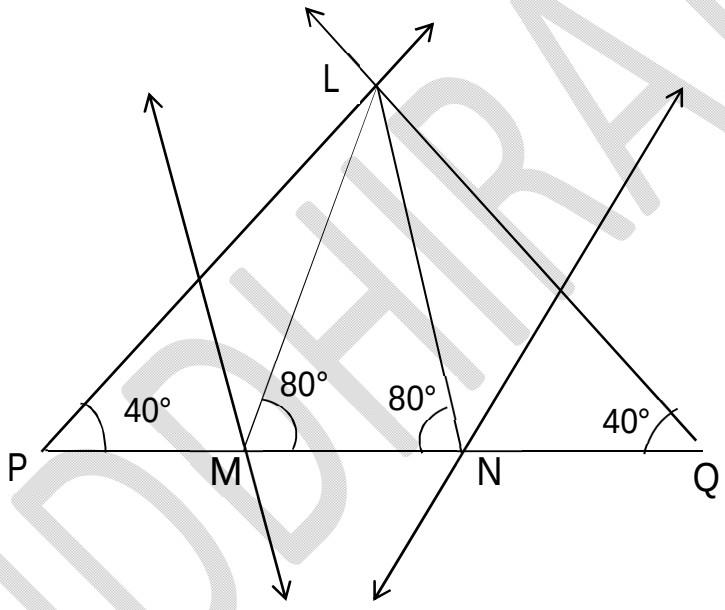
$\therefore \angle P = \frac{1}{2} \angle LMN \quad \therefore \angle Q = \frac{1}{2} \angle LNM$

$\therefore \angle P = \frac{1}{2} \times 80° \qquad \therefore \angle Q = \frac{1}{2} \times 80°$

$\angle P = 40° \qquad \therefore \angle Q = 40°$

We can construct Δ LPQ such that PQ = 11cm

$\angle M = 40°$, $\angle N = 40°$



Steps of construction:

I) Draw seg PQ of 11 cm

II) Draw a ray making an angle of 40° at point P

III) Draw a ray making an angle of 40° at point Q

IV) Name the point of intersection of the two rays

As L

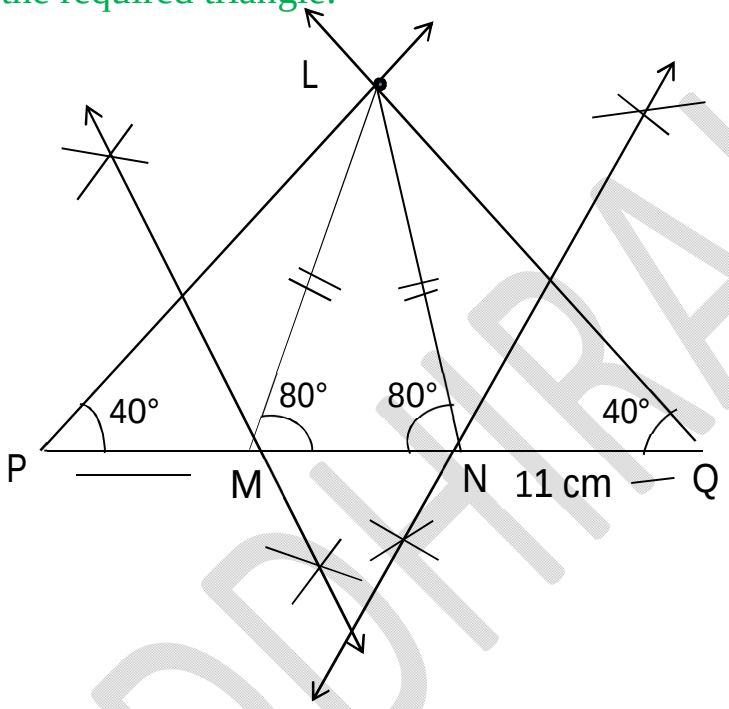
V) Draw the perpendicular bisectors of seg LP and

Seg LQ. Name the points as M and N respectively,

where the perpendicular bisector intersect line PQ.

VI) Draw seg LM and seg LN

Δ LMN is the required triangle.



Q.25) The perimeter of triangle 18 cm and the ratior of Length of its sides 3:4 :5 . construct the triangle.

Solution: Let the perimeter of Δ ABC is 18 cm

AB : BC : AC = 3 : 4 : 5

Let the common multiple be ‘ x’

AB = 3x, BC = 4x , AC = 5x

Now,

AB + BC + AC = 18

3x + 4x + 5 x = 18

$12x = 18$

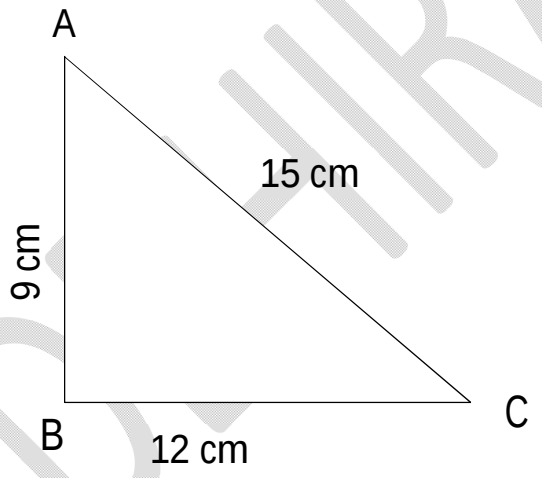
$X = \frac{18}{12}$

$X = \frac{3}{2}$

$\therefore AB = 3x = 3 \times \frac{3}{2} = \frac{18}{2} = 9$ cm

$\therefore BC = 4x = 4 \times \frac{3}{2} = \frac{24}{2} = 12$cm

$\therefore AC = 5x = 5 \times \frac{3}{2} = \frac{30}{2} = 15$cm



Steps of construction:

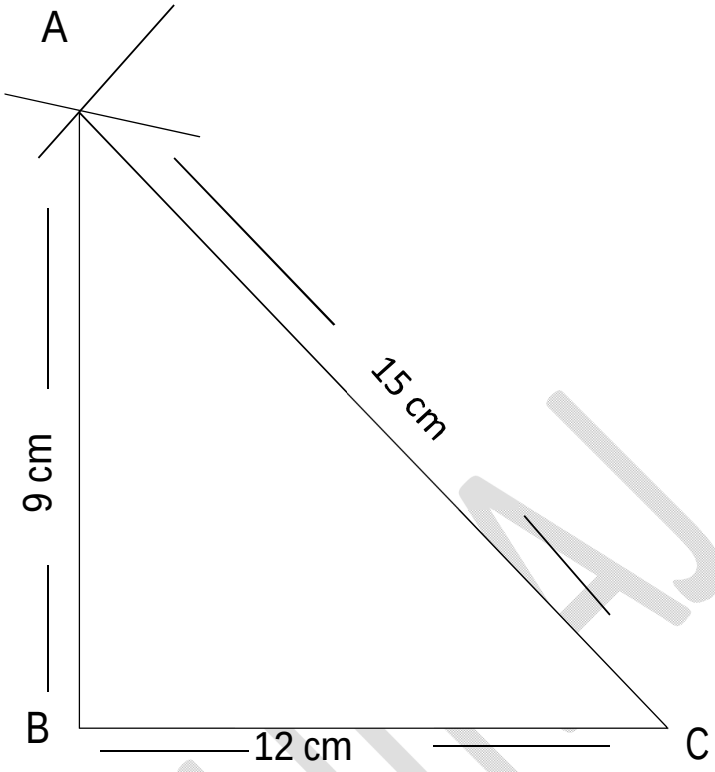
I) Draw base BC = 12 cm

II) Draw the arc of 9 cm radius taking B as center.

III) Draw the arc 15 cm radius taking with center C.

IV) Let the arc are intersect at point A.

Δ ABC is the required triangle.



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