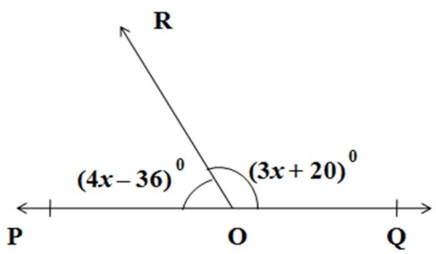
2 Parallel lines

Extra Questions

Q.1) In the given figure, what value of x will make POQ straight line. (3 mark)



Solution-

$\angle POR$ and $\angle ROQ$ are linear pair.

Sum of linear pairs are 180^0

$\therefore m\angle POR + m\angle QOR = 180^0$

$4x - 36^0 + 3x + 20^0 = 180^0$

$4x + 3x - 36 + 20 = 180$

$7x - 36 + 20 = 180$

$7x - 16 = 180$

$7x = 180 + 16$

$7x = 196$

$x = \frac{196}{7}$

$x = 28.$

Q.2) Two parallel lines intersect a transversal measure of interior angle ratio is 3:7, then how much large angle will be between two angles? (3 mark)

Solution-

The measure of interior angle ratio 3:7

Let equal ratio be x.

Measure of these angles are 3x and 7x respectively.

$\therefore 3x + 7x = 180^0$

$\therefore 10x = 180^0$

$x = \frac{180^0}{10}$

$\therefore x = 18^0$

$\therefore$ Measure of large angle ($7x$) $= 7 \times 18^0 = 126^0$

$\therefore$ Measure of large interior angle 126^0.

Q.3) If ($3x - 58^0$) and ($x + 38^0$) are supplementary, then find x. (3 mark)

Solution- Sum of linear pairs are 180^0.

$(3x - 58^0) + (x + 38^0) = 180^0$

$3x - 58^0 + x + 38^0 = 180^0$

$3x + x + 38^0 - 58^0 = 180^0$

$4x - 20^0 = 180^0$

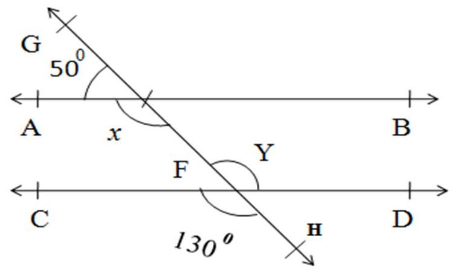
$4x = 180^0 + 20^0$

$4x = 200^0$

$x = \frac{200^0}{4}$

$x = 50^0$

Q.4) In the figure, find the value of x and y then show that AB || CD. (3 mark)



Solution- Ray AE stands on line GH.

$\therefore \angle AEG + \angle AEH = 180^0$ ... Linear pair

$\therefore 50^0 + x = 180^0$

$\therefore x = 180^0 - 50^0$

$x = 130^0$ ... (I)

$\therefore y = 130^0$ ----vertically opposite angle .. (II)

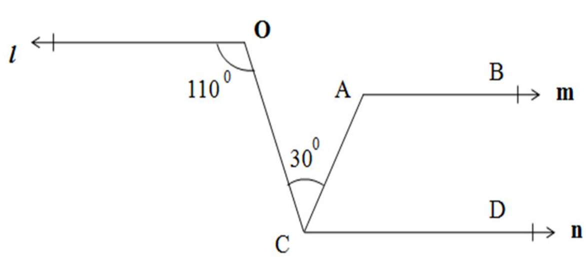
From I and II

x = y

But these are alternate interior angle and they are equal.

So we can say that AB || CD.

Q.5) Line l || line m || line n then from the figure find the measure of $\angle A$. (4 mark)



Solution- line l || line n ------ (given)

$\therefore \angle O = \angle OCD$ ... (Alternate angles)

$\therefore \angle OCD = 110^0$ ... $\because \angle O = 110^0$

$\therefore \angle OCA + \angle ACD = \angle OCD$ ... (Adjacent angles)

$\therefore 30^0 + \angle ACD = 110^0$

$\therefore \angle ACD = 110^0 - 30^0$

$\angle ACD = 80^0$

line m ∥ line n ... (given)

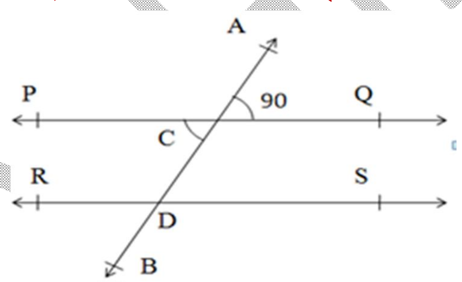
$\angle A + \angle ACD = 180^0$ ... interior angle

$\therefore \angle A + 80^0 = 180^0$

$\therefore \angle A = 180^0 - 80^0$

$\therefore \angle A = 100^0$

Q.6) In the figure line PQ ∥ line RS and line AB is their transversal $\angle ACQ = 80^0$. Find the measure of following angles. I) $\angle PCA$ II) $\angle QCD$ III) $\angle CDS$ IV) $\angle RDB$ (4 mark)



Solution-

I) $\angle PCA$

$\angle ACQ + \angle PCA = 180^0$ ... (linear pair)

$80^0 + \angle PCA = 180^0$ ... ($\angle ACQ = 80^0$ given)

$\angle PCA = 180^0 - 80^0$

$\angle PCA = 100^0$

II) $\angle QCD$

$\angle QCD = \angle PCA$ ---- vertically opposite angles

$\therefore \angle QCD = \angle PCA = 80^0$

$\therefore \angle QCD = 80^0$

III) $\angle CDS$

line PQ ∥ line RS and AB is transversal

$\therefore \angle ACQ = \angle CDS$ ...property of corresponding angles of parallel lines

$\therefore \angle ACQ = \angle CDS = 80^0$

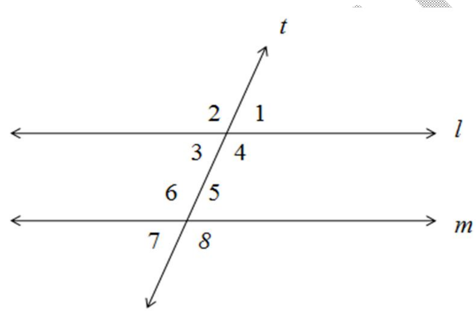
$\therefore \angle CDS = 80^0$

IV) $\angle RDB$

$\angle CDS = \angle RDB$ ---- vertically opposite angles

$\therefore \angle RDB = 80^0$

Q.7) In the given figure, $l \parallel m$ and a transversal cuts them. If $\angle 1 = 70^0$. Find the measure of each of the remaining marked angles. (4 mark)



Solution- Clearly, a ray t stands on line l making adjacent angles of $\angle 1$ and $\angle 2$.

$\therefore \angle 1 + \angle 2 = 180^0$

$70^0 + \angle 2 = 180^0$

$\angle 2 = 180^0 - 70^0$

$\angle 2 = 110^0$

$\therefore \angle 4 = \angle 2 = 110^0$ ---- vertically opposite angles

and $\therefore \angle 3 = \angle 1 = 70^0$ ---- vertically opposite angles

Now, $l \parallel m$ and t is the transversal

$\therefore \angle 5 = \angle 3 = 70^0$ (alternate interior of angle)

$\angle 6 = \angle 4 = 110^0$ (alternate interior of angle)

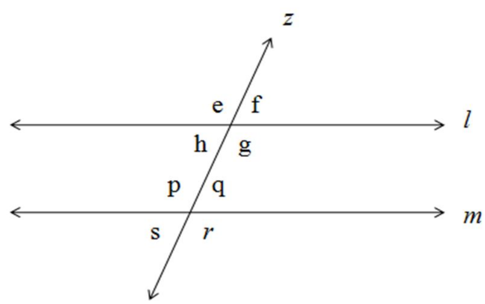
$\angle 7 = \angle 3 = 70^0$ (corresponding angle) and $\angle 8 = \angle 4 = 110^0$ (corresponding angle)

$\therefore \angle 2 = 110^0, \angle 3 = 70^0, \angle 4 = 110^0, \angle 5 = 70^0,$
$\angle 6 = 110^0, \angle 7 = 70^0,$ and $\angle 8 = 110^0$.

Q.8) In the figure, line z is a transversal of line *l* and line *m*. Answer the following, (2 mark)

a) State pairs of alternate interior angles.

b) State pairs of alternate exterior angles.

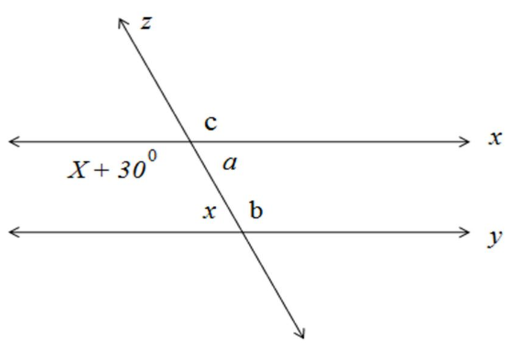


Solution-

a) Alternate interior angles. 1) $\angle h, \angle q$ ii) $\angle g, \angle p$

b) Alternate exterior angles. 1) $\angle e, \angle r$ ii) $\angle f, \angle s$

Q.9) In the figure, parallel lines X and Y are intersected by transversal S.. Find $\angle C, \angle a, \angle b$ (4 mark)



Solution- line X || line Y, line S is a transversal.

$\therefore x + x + 30^0 = 180^0$ ------------ Interior angle theorem)

$2x + 30^0 = 180^0$

$2x = 180^0 - 30^0$

$2x = 150^0$

$x = \frac{150}{2}$

$x = 75^0$

$\therefore x + 30^0 = 75^0 + 30^0 = 105^0$

$\angle c = (x + 30^0)$ ---------(vertically opposite angles)

$\angle c = 105^0$

$\angle a = x$ --------------------- (alternate angles theorem)

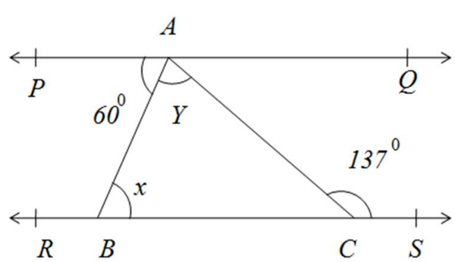
$\angle a = 75^0$

$\angle b = (x + 30^0)$ ---------- (alternate angles theorem)

$\angle b = 105^0$

Thus, $\angle a = 75^0$, $\angle b = 105^0$, $\angle c = 105^0$

Q.10) In figure, line PQ || line RS. $\angle PAB = 60^0$, $\angle ACS = 137^0$. Find x and y. (4 mark)



Solution-

line PQ || line RS and line RS is transversal.

$\therefore \angle QAC + \angle ACS = 180^0$--- interior angle theorem

$\therefore \angle QAC + 137^0 = 180^0$

$\therefore \angle QAC = 180^0 - 137^0$

$\therefore \angle QAC = 43^0$ ... I)

line PQ || line RS and line AB is transversal

$\angle PAB \cong \angle ABC$ ----- (II) Alternate angles theorem

$\angle PAB = 60^0$ ---------(III) (given)

$\therefore \angle ABC = x = 60^0$ – (from I and II)

$\angle PAB + \angle BAC + \angle QAC = 180^0$------ (Angles in a linear pair)

$\therefore 60^0 + y + 43^0 = 180^0$

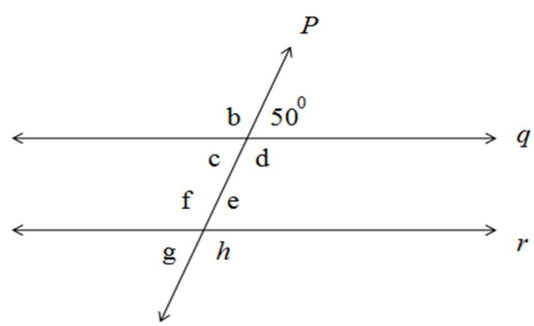
$y + 103^0 = 180^0$

$y = 180^0 - 103^0$

$y = 77^0$

$\therefore x = 60^0$ and $y = 77^0$

Q.11) In the adjoining figure, If line q || line r and line P is transversal, then find the value of c,e,h. (3 mark)



Solution-

$\angle c = 50^0$ ... (pair of vertical opposite angle)

Now, line a || line r and P is transversal.

$\therefore \angle e = \angle c$ (alternate angle)

$\therefore \angle e = 50^0$

Now, $\angle h + \angle e = 180^0$ ... angle in linear pair

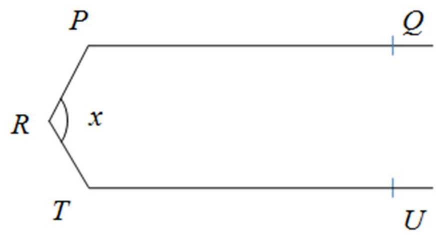
$\therefore \angle h + 50^0 = 180^0$

$\therefore \angle h = 180^0 - 50^0$

$\therefore \angle h = 130^0$

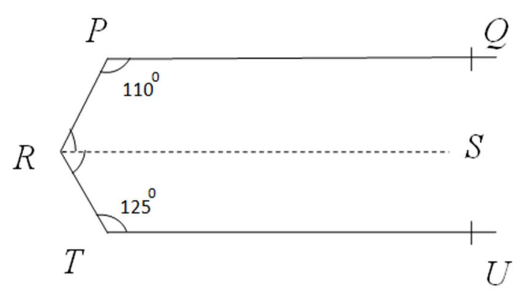
$\therefore \angle c = 50^0, \angle e = 50^0, \angle h = 130^0$

Q.12) In the adjoining figure, PQ || TU and $\angle PRT = x^0$. If $\angle RPQ = 110^0$ and $\angle RTU = 125^0$ then find x. (4 mark)



Solution- Through O draw RS ∥ PQ ∥ TU.

Then , ∠ PRS + ∠ TRS = x^0



Now,

PQ ∥ RS and PR is a transversal

∴ ∠ RPQ + ∠ PRS = 180^0

110^0 + ∠ PRS = 180^0

∠ PRS = $180^0 - 110^0$

∠ PRS = 70^0

Let, TU ∥ RS and RT is a transversal

∴ ∠ TRS + ∠ RTU = 180^0

∴ ∠ TRS + 125^0 = 180^0

∴ ∠ TRS = $180^0 - 125^0$

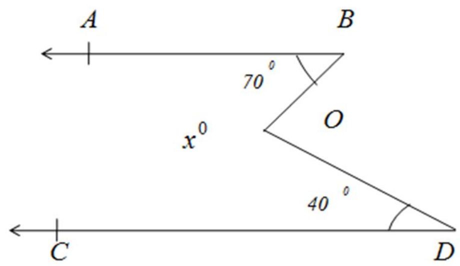
∴ ∠ TRS = 55^0

∴ ∠ PRT = ∠ PRS + ∠ TRS

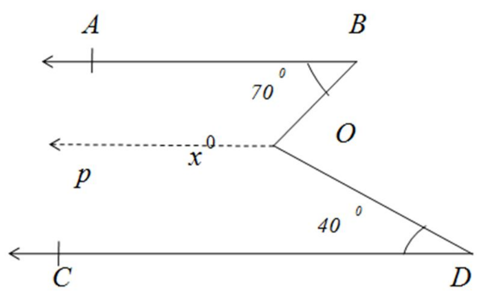
= $70^0 + 55^0$

= 125^0

Q.13) If AB ∥ CD, $\angle ABO = 70^0$, $\angle CDO = 40^0$ then find $\angle x$ (4 mark)



Solution- Through O draw OP ∥ AB.



AB ∥ CD ---------------------Construction

$\therefore \angle ABO + \angle BOP = 180^0$ ... (interior angle)

$\therefore 70^0 + \angle BOP = 180^0$

$\angle BOP = 180^0 - 70^0$

$\angle BOP = 110^0$ ... (I)

OP ∥ CD ... (OP ∥ AB, AB ∥ CD)

$\therefore \angle CDO + \angle DOP = 180^0$ ...

$40^0 + \angle DOP = 180^0$

$\angle DOP = 180^0 - 40^0$

$\angle DOP = 140^0$ ... (II)

Now

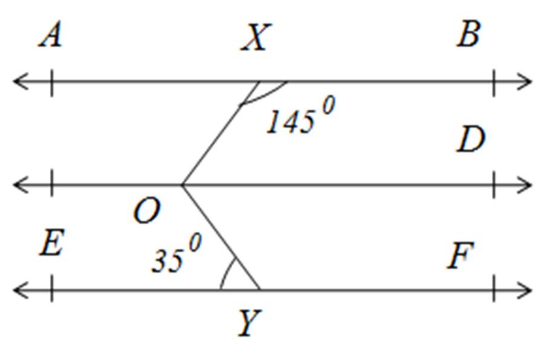
$\angle BOP + \angle DOP = \angle x$

$\therefore \angle x = 110^0 + 140^0$ ----(From I and II)

$\angle x = 250^0$

Q.14) In the given diagram, line AB || line OD || line EF then

$\angle BXO = 145^0$] $\angle EYO = 35^0$ Find $\angle XOY$ (3 mark)



Solution-

Line AB || OD] XO is a transversal

$\angle BXO + \angle XOD = 180^0$ ... interior angle theorem

$145^0 + \angle XOD = 180^0$

$\angle XOD = 180^0 - 145^0$

$\angle XOD = 35^0$

line OD || EF] DY is a transversal,

$\angle OYE \cong \angle DOY$ ... alternate angle theorem

$\angle OYE = 35^0$ ...given

$\angle DOY = 35^0$

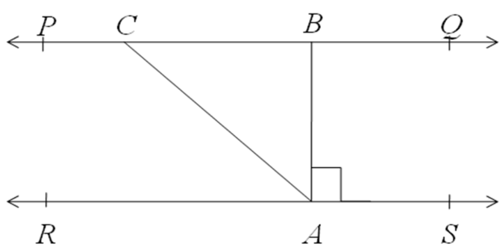
$\therefore \angle XOY = \angle XOD + \angle DOY$

$= 35^0 + 35^0$

$= 70^0$

Q.15) In the adjoining figure, If PQ || RS, AB ⊥ RS and

$\angle CAS = 138^0$, $\angle PCA$, $\angle CAB$ and $\angle BCA$ (4 mark)



Solution- PQ || RS and CA is transversal

$\therefore$ Interior angle are same

$\therefore \angle PCA = \angle CAS$

But $\angle CAS = 138^0$ — — — — — — given

$\therefore \angle PCA = 138^0$

Now,

$= \angle CAS = 138^0$

$\angle CAB + \angle BAS = \angle CAS$

$\angle CAB + 90^0 = 138^0$

$\angle CAB = 138^0 - 90^0$

$\angle CAB = 48^0$

PQ || RS and CA is transversal

$\therefore \angle BCA + \angle CAS = 180^0$

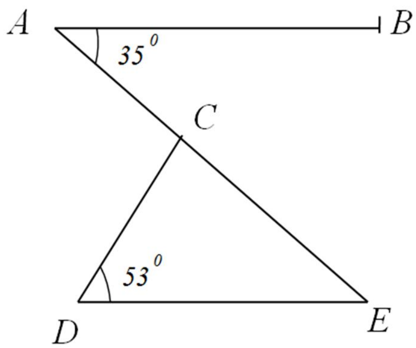
$\therefore \angle BCA + 138^0 = 180^0$

$\therefore \angle BCA = 180^0 - 138^0$

$\therefore \angle BCA = 42^0$

$\therefore \angle PCA = 138^0, \angle CAB = 48^0, \therefore \angle BCA = 42^0$

Q.16) In the adjoining figure, if AB || DE, $\angle BAC = 35^0$ and $\angle CDE = 53^0$ Find $\angle DCE$ (4 mark)



Solution- AB || DE and AE is a transversal

∴ $\angle BAC = \angle AED$ ----- (Interior alternate angle)

But,

$\angle BAC = 35^0$ --- given

∴ $\angle AED = 35^0$

In, △ CED,

$\angle CDE + \angle DEC + \angle DCE = 180°$ (Sum properties of angle)

$53^0 + 35^0 + \angle DCE = 180^0$ – – – (given)

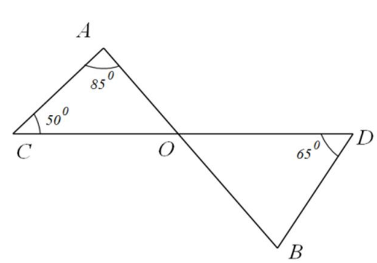
∴ $\angle DCE = 180^0 - 53^0 - 35^0$

∴ $\angle DCE = 180^0 - 88^0$

∴ $\angle DCE = 92^0$

Q.17) In the given figure, line AB and line CD intersect at point O, then $\angle ACO = 50^0$, $\angle CAO = 85^0$, $\angle ODB = 65^0$,

Find $\angle DBO$ (4 mark)



Solution – In Δ ACO

∠ A + ∠ C + ∠ AOC = 180°(sum properties of angle)

$85^0 + 50^0 + \angle AOC = 180^0$

$135^0 + \angle AOC = 180^0$

$\angle AOC = 180^0 - 135^0$

$\angle AOC = 45^0$

But,

AB and CD intersect at point O.

$\angle AOC = \angle BOD$

$\angle BOD = 45^0$ – –vertically opposite angle

In Δ OBD

∠ OBD + ∠ DOB + ∠ D =180° (Sum properties of angle)

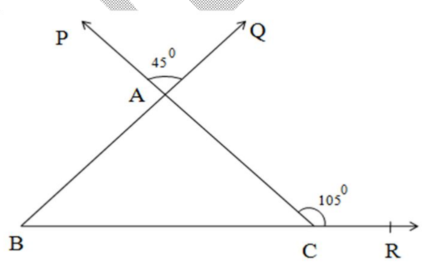
$65^0 + 45^0 + \angle DBO = 180^0$

$\angle DBO = 180^0 - 65^0 - 45^0$

$\angle DBO = 180^0 - 110^0$

$\angle DBO = 70^0$

Q.18) In adjoining figure, Find m ∠ABC (3 mark)



Solution-

$\angle PAQ = \angle BAC$ – –vertically opposite angle

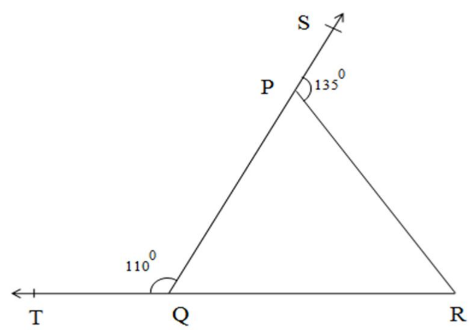
$\therefore \angle BAC = 45^0$

Now, $\therefore \angle ACR = \angle ABC + \angle BAC = 105^0$

$\therefore \angle ABC = 105^0 - 45^0$

$= 60^0$

Q.19) In the adjoining figure, sides QP and RQ of Δ PQR are produced to point S and T respectively. If $\angle$ SPR = 135^0, $\angle$ PQT = 110^0. Find $\angle$ PRQ (3 mark)



Solution-

TQR is a straight line.

$\angle$ TQR + $\angle$ PQR = 180^0 -- linear pair

110^0 + $\angle$ PQR = 180^0

$\angle$ PQR = 180^0 – 110^0

$\angle$ PQR = 70^0

Since the side QP of Δ PQR is produced to S.

Exterior angle so formed is equal to the sum of interior opposite angles.

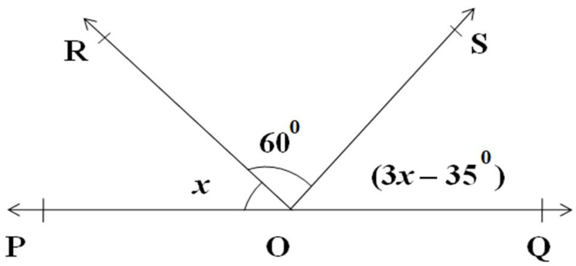
$\angle$ PQR + $\angle$ PRQ = 135^0

70^0 + $\angle$ PRQ = 135^0 [$\because$ PQR = 70^0]

$\angle$ PRQ = 135^0 – 70^0

$\angle$ PRQ = 65^0

Q.20) In the adjoining figure, find $\angle$POR and $\angle$QOS (3 mark)



Solution- POQ is a straight line, then,

$\angle POR + \angle ROS + \angle QOS = 180^0$ – – – linear pair

$x + 60^0 + (3x - 35^0) = 180^0$

$x + 60^0 + 3x - 35^0 = 180^0$

$x + 3x = 180^0 + 35 - 60$

$4x = 180 - 24$

$4x = 156$

$x = \frac{156}{4}$

$x = 39$

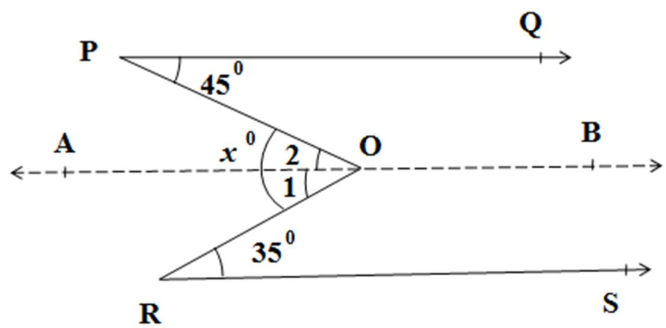
$\angle QOS = 3x - 35^0$

$= 3(39) - 35^0$

$= 123 - 35^0$

$= 82$·

Q.21) In the adjoining figure, PQ || RS then find the value of x. (3 mark)



Solution-

Let us draw AB || PQ.

∴ PQ || RS

Now AB || RS and RD is a transversal then,

$\angle 1 = 35^0$ – – – (Alternate Angle)

Similarly,

$\angle 2 = 45^0$.

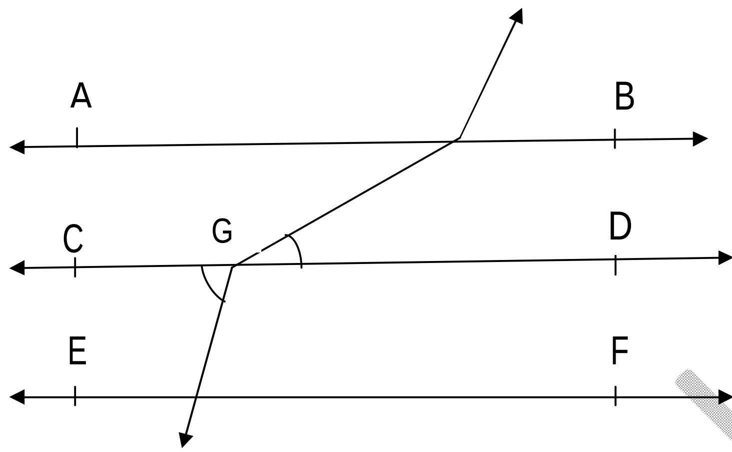
Adding $\angle 1 + \angle 2 = 35^0 + 45^0$

$x = 80^0$

$\therefore x = 80^0$

Q.22) In the adjoining figure, AB || CD || EF, PQ || RS. $\angle RQD = 35^0$ and $\angle CQP = 70^0$ Find $\angle QRS$

(4 mark)



Solution –

CD is line and extend ray QP.

$\therefore \angle CQP + \angle PQD = 180^0$

$\therefore 70^0 + \angle PQD = 180^0$

$\angle PQD = 180^0 - 70^0$

$\angle PQD = 110^0$

$\therefore \angle PQR = \angle PQD + \angle RQD$

$= 110^0 + 35^0 = 145^0$

Now,

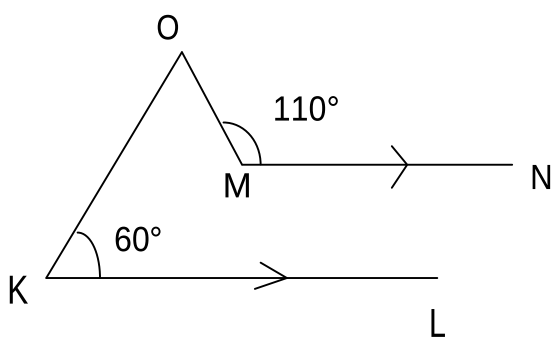
PQ || RS and QR is a transversal.

$\therefore \angle QRS = \angle PQR = 145^0$ – –(interior alternate angle)

$\therefore \angle QRS = 145^0$

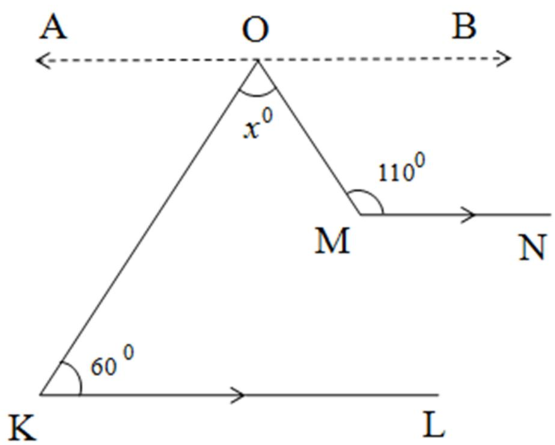
Q.23) In the adjoining figure, KL || MN ∠ LKO = 60°

∠KOM = x and ∠ OMN = 110°then find the value of x (4 mark)



Solution –

Through O draw a line AOB || KL || MN Now,



AO || KL and OK is the transversal

$\therefore \angle AOK = \angle OKL = 60^0$ – –alternate interior angle.

OB || MN and OM is the transversal.

$\therefore \angle BOM + \angle OMN = 180^0$ interior angle

$\angle BOM + 110^0 = 180^0$
$\angle BOM = 180^0 - 110^0$
$\angle BOM = 70^0$

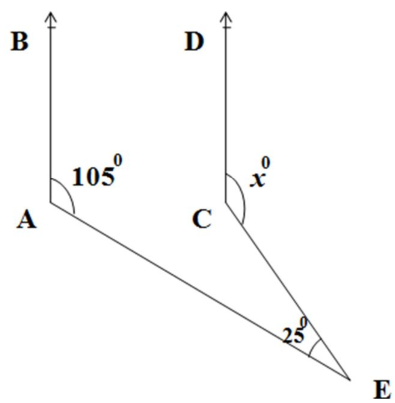
Now, AOB is a straight line.

$\therefore \angle AOK + \angle KOM + \angle BOM = 180^0$ – –straight line

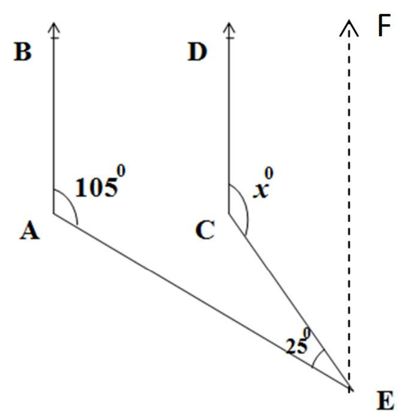
$60^0 + x^0 + 170^0 = 180^0$
$x^0 + 230^0 = 180^0$
$230^0 - 180^0 = x^0$
$x^0 = 50^0$

$\therefore$ x = 50^0

Q.24) In the given figure , AB || CD, $\angle$ EAB = 105^0, $\angle$AEC = 25^0 and $\angle$ECD = x^0. Find the value of x. (4 mark)



Solution – From E, draw EF ∥ AB ∥ CD



EF ∥ CD and CE is transversal.

$\therefore$ $\angle DEC + \angle CEF = 180^0$ – –corresponding angles

$x^0 + \angle$ CEF = 180^0

$\angle$ CEF = $(180^0 - x^0)$

Again, EF || AB and AE is the transversal.

$\therefore \angle BAE + \angle AEF = 180^0$ – –corresponding angle

$105^0 + \angle AEC + \angle CEF = 180^0$

$105^0 + 25^0 + (180^0 - x^0) = 180^0$

$105^0 + 25^0 + 180^0 - x^0 = 180^0$

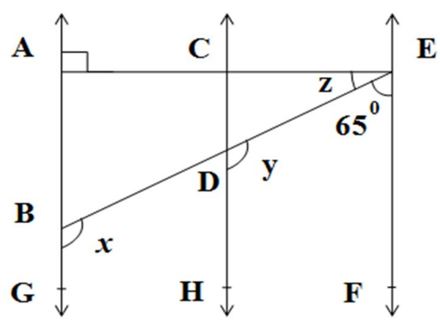
$130^0 + 180^0 - x^0 = 180^0$

$310^0 - x^0 = 180^0$

$310^0 - 180^0 = x^0$

$\therefore x = 130^0$

Q.25) In the given figure, AB || CD || EF , ∠DBG = x] ∠EDH = y] ∠AEB = z] ∠EAB = 90^0 and ∠BEF = 65^0. FInd the value of x, y and z. (4 mark)



Solution-

EF ∥ CD and ED is the transversal.

$\therefore \angle FED + \angle EDH = 180^0$ — (interior angle)

$65^0 + y = 180^0$

$y = 180^0 - 65$

$y = 115^0$

Now,

CH ∥ AG and DB is the transversal.

$\therefore x = y = 115^0$ … … (Corresponding angle)

Now, ABG is a straight line.

$\therefore \angle ABE + \angle EBG = 180^0$ (linear pair)

$\therefore \angle ABE + x = 180^0$— $(x = 115^0)$

$\therefore \angle ABE + 115^0 = 180^0$□□

$\therefore \angle ABE = 180^0 - 115^0$

$\therefore \angle ABE = 65^0$

We know that the sum of the angles of a triangle is 180^0

In Δ EAB we get,

$\angle EAB + \angle ABE + \angle BEA = 180^0$

$90^0 + 65^0 + z = 180^0$

$155^0 + z = 180^0$

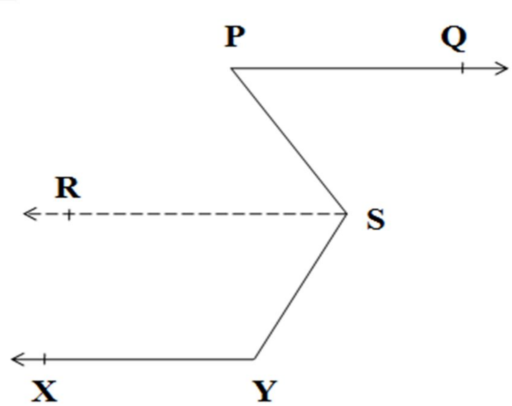
$z = 180^0 - 155^0$

$z = 25^0$

$\therefore x = 115^0$, $y = 115^0$] $z = 25^0$

Q.26) In the adjoining figure, XY || PQ, Prove that,

$\angle XYS + \angle YSP = 180^0 + \angle SPQ$· (4 mark)



Solution –

Construction- Draw SR || YX

Proof- SR || YX and SY is the transversal

$\therefore \angle XYS + \angle YSR = 180^0$ – –(I) Interior angle

Now,

RS ∥ PQ and PS is the transversal.

$\therefore \angle RSP = \angle SPQ$ --- (II) --- Alternate Angle

From I and II

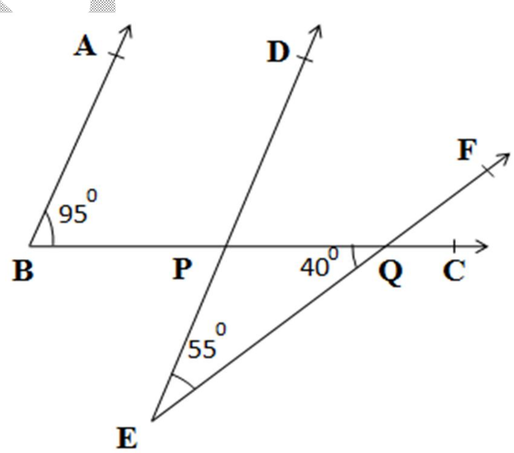
Left side = Right side

$\therefore \angle XYS + \angle YSR + \angle RSP = 180^0 + \angle SPQ$

$\therefore \angle XYS + \angle YSP = 180^0 + \angle SPQ$

--- ($\angle YSR + \angle RSP = \angle YSP$)

Q.27) In the given figure, $\angle ABC = 70^0$ and $\angle DEF = 55^0$. the arms DE and EF of $\angle DEF$ at BC at P and Q respectively. Prove that PD ∥ BA.



Solution-

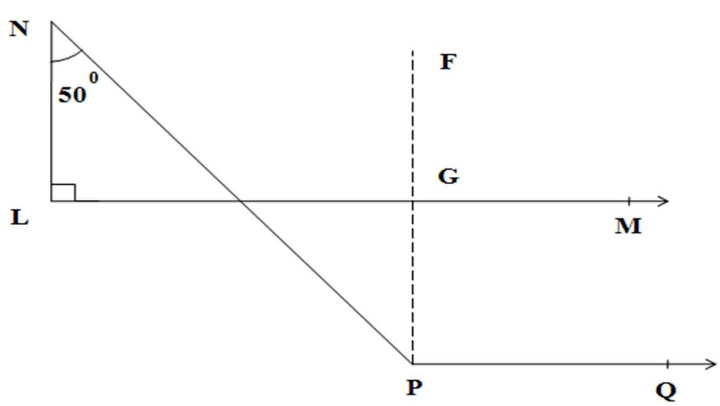
Let $\angle EPQ = x^0$

We know that the sum of the angles of triangle is 180^0

$\therefore \angle EPQ + \angle PEQ + \angle EQP = 180^0$
$\angle EPQ + 55^0 + 40^0 = 180^0$
$\angle EPQ + 95^0 = 180^0$

$\angle EPQ = 180^0 - 95^0$
$\therefore \angle EPQ = 85^0$
Now, EPD is a straight line.
$\therefore \angle EPQ + \angle DPQ = 180^0$
$85^0 + \angle DPQ = 180^0$
$\angle DPQ = 180^0 - 85^0$
$\angle DPQ = 95^0$
$\therefore \angle ABP = \angle DPQ$ — — — (each 95^0)
But these are corresponding angles.
Hence, PD || BA

Q.28) In the given figure, LM || PQ. $\angle L = 90^0$ and $\angle LNP = 50^0$] Find $\angle NPQ$ (4 mark)



Solution- Through P draw PF || LN,

cutting LM at G.

Now, PF || LN and NP is the transversal.

$\therefore \angle NPG = \angle LNP = 50^0$— (alternate angle)

Now,

PF || LN and LGM is a transversal.

$\therefore \angle FGM = \angle NLG = 90^0$— (corresponding angle)

Again,

LM || PQ and GP is a transversal.

$\therefore \angle GPQ = \angle FGM = 90^0$— II) Corresponding angle

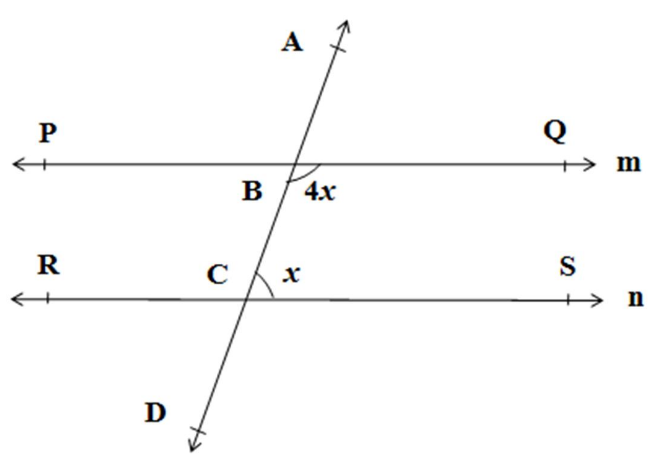
$\therefore \angle NPQ = \angle NPG + \angle GPQ$— (sum of angle)

$= 50^0 + 90^0$ – –from II

$= 140^0$

$\therefore \angle NPQ = 140^0$

Q.29) In the given figure, if line m || line n and line P is a transversal then find x. (3 mark)



line m || line n and line P is a transversal.

$\therefore \angle QBC + \square = 180^0 = \ldots$ (________)

$\therefore \square = 180^0$

$\therefore x = \square$

Solution- line m || line n and line P is a transversal.

$\therefore \angle QBC + \boxed{\angle BCS} = 180^0 = \ldots$ (interior angle)

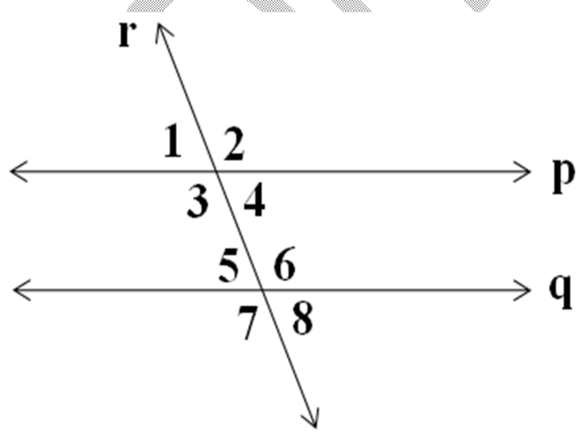
$\therefore \boxed{4x + x} = 180^0$

$\boxed{5x} = 180^0$

$\therefore x = \boxed{\frac{180^0}{5}}$

$\therefore x = \boxed{36^0}$

Match the following in adjoining figure (1 mark each)



Q.30) State the pair of interior angle.

Solution- $\angle 4, \angle 6$, and $\angle 3, \angle 5$.

Q.31) State the pairs of corresponding angle.

Solution : $\angle 1, \angle 5$, and $\angle 2, \angle 6$

∠3, ∠7 and ∠4, ∠8.

Q.32) State the pairs of vertically opposite angle.

Solution - ∠1, ∠4 and ∠2, ∠3

∠6, ∠7 and ∠5, ∠8

Q.33) State the pairs of interior alternate angle.

Solution - ∠3, ∠6 and ∠4, ∠5

Q.34) State the pairs of exterior alternate angle.

Solution - ∠1, ∠8 and ∠2, ∠7

Which of the following statement are true or false.

Q.35) The angles in a linear pair are supplementary.

Solution- True.

Q.36) If one of the pairs of alternate angles is not congruent then the lines are parallel.

Solution- False.

Reason- If one of the pairs of alternate angles is congruent then the lines are parallel.

Q.37) The sum of measures of all angles of a triangle is 360^0.

Solution- False

Reason – The sum of measures of all angles of a triangle is 180^0.

Q.38) When two lines intersect, the pairs of opposite angles formed are different.

Solution : False

Reason – When two lines intersect, the pairs of opposite angles formed are congruent.

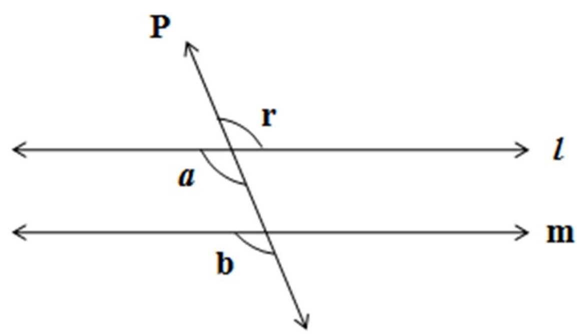
Q.39) If two parallel lines are intersected by a transversal, the Interior angles on either side of the transversal are supplementary.

Solution – True.

Q.40) If a line is perpendicular to two lines in a plane, then the two lines are parallel to each other.

Solution – True.

Q.41) In the adjoining figure, line l || line m and P is a transversal. If r = 140^0 then find a and b. (3 marks)



Solution – line l || line m and P is a transversal.--- (given)

$\angle r = \angle a$--------(vertically opposite angle)

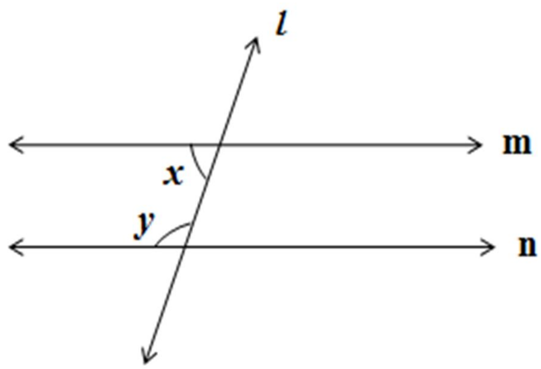
$140^0 = \angle a$

$\therefore \angle a = 140^0$

$\therefore \angle b = 140^0$ ------------ (corresponding angle)

$\therefore \angle a = 140^0$ and $\angle b = 140^0$

Q.42) In the adjoining figure, $x = 71^0$ and $y = 70^0$ then line m || line n these statement are true or false. (3 marks)



Solution - $x = 71^0$ and $y = 70^0$— (given)

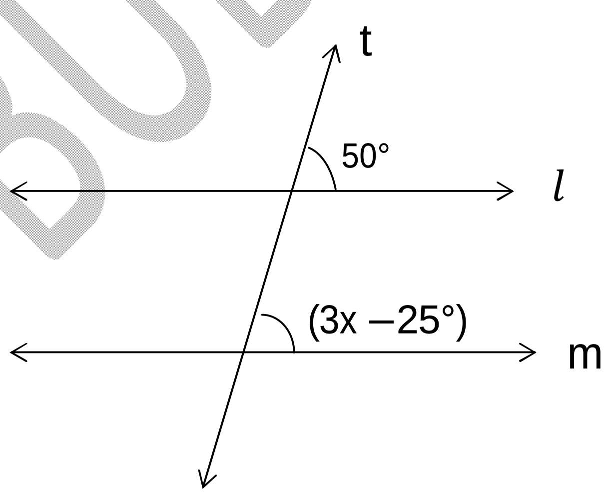
line m || line n and l is the transversal.

$\angle x$ and $\angle y$ are the pair of the alternate angles.

From pair of interior angle, $\angle x$ and $\angle y$ are not supplementary.

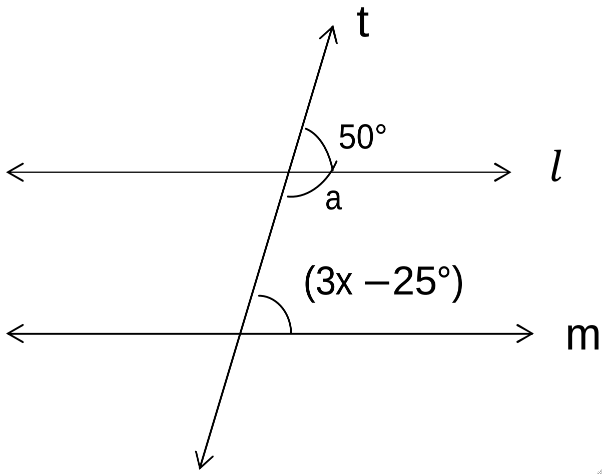
line n || line n are not parallel.

Q.43) In the adjoining figure, line l || line m and line t is the transversal is then find the value of x. (4 marks)



Solution – In this figure, Take $\angle a$.

$\angle a$ and measure of angle 50^0 are linear pair.



$\angle a + 50^0 = 180^0$

$\angle a = 180^0 - 50^0$

$\angle a = 130^0$

Now,

$\angle a + 3x - 25 = 180^0 \ldots\ldots\ldots\ldots$ (interior angle)

$\therefore 130^0 + 3x - 25 = 180^0 \quad \ldots (\because \angle a = 130^0)$

$\therefore 3x + 105 = 180^0$

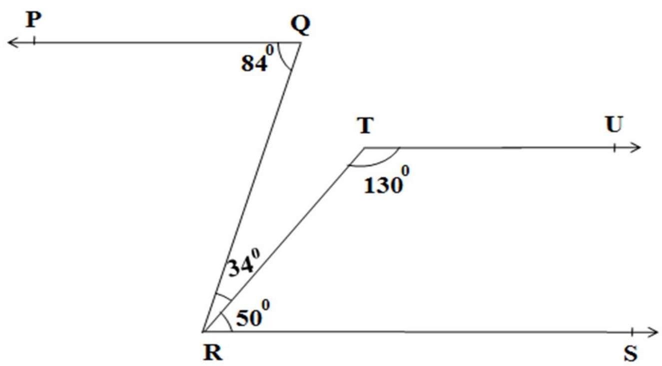
$3x = 180^0 - 105$

$3x = 75$

$x = \frac{75}{3}$

$\therefore x = 25$

Q.44) In the adjoining figure, some measure of angle are given then prove that Ray QP and ray TU are parallel. (4marks)



Solution:

$m\angle QRT + m\angle TRS = m\angle QRS$

$\therefore 34^0 + 50^0 = m\angle QRS$ – –In figure

$\therefore m\angle QRS = 84^0$ ... (I)

Ray QP and Ray RS these lines have RQ as transversal.

$\therefore \angle PQR = \angle QRS$— (alternate angle)

$\therefore m\angle PQR = 84^0$ ... (II)

$\therefore$ Ray QP ||Ray RS … … . . (Test of alternate angle)

Now,

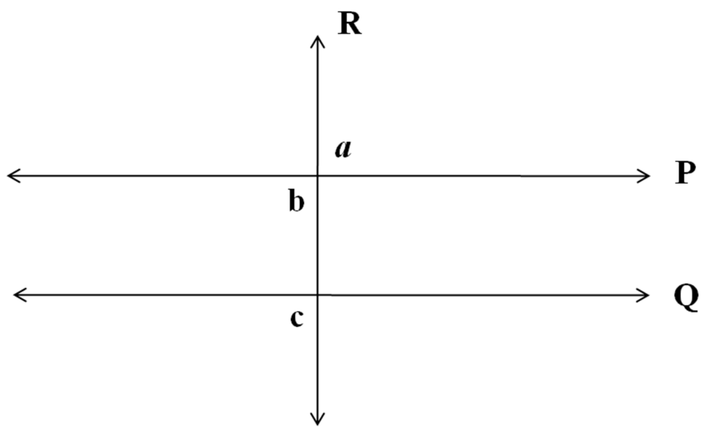
$m\angle T + m\angle TRS = 130^0 + 50^0$

$= 180^0$

$\therefore$ Ray RS || Ray TU --- (IV) Test of interior angle

$\therefore$ Ray QP || Ray TU --- (from II and IV)

Q.45) In the adjoining figure line P || line Q and line R is the transversal. If $a = 40^0$ then find a : b (3 mark)



Solution - $\angle a = \angle b$ ----(Pair of vertically opposite angle)

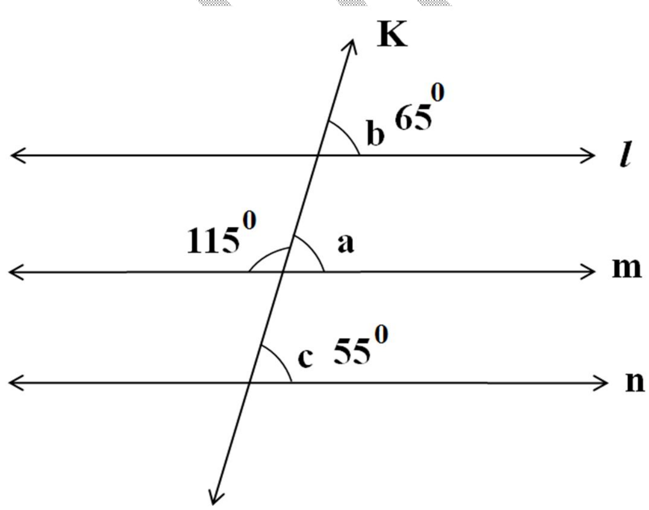
$\angle b = 40^0$ ----- ($\because \angle a = 40^0$)

$\angle c = 180^0 - 40^0$

$\angle c = 140^0$

$\therefore b : c = 40 : 140 = 2 : 7$

Q.46) In the adjoining figure, some measures of angles are given then two lines are parallel are not, justify. (4 mark)



Solution - $\angle a = 180^0 - 125^0$ .... angle in linear pair

$\angle a = 65^0$

$\therefore \angle b = \angle a = 65^0$ ... (I)

line l || line m --------(test of corresponding angle of parallel lines)

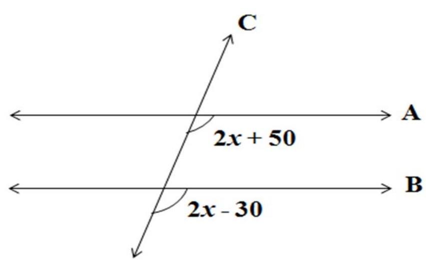
$\angle b \neq \angle c$

line *l* and line *n* are not similar.

$\angle a \neq \angle c$

line *m* and line *n* are not similar.

Q.47) line A || line B and C is the transversal then find the value of x. (3 mark)



Solution - $(2x + 50) + (2x - 30) = 180^0$

$2x + 50 + 2x - 30 = 180^0$

$4x + 50 - 30 = 180^0$

$4x + 20 = 180^0$

$4x = 180^0 - 20^0$

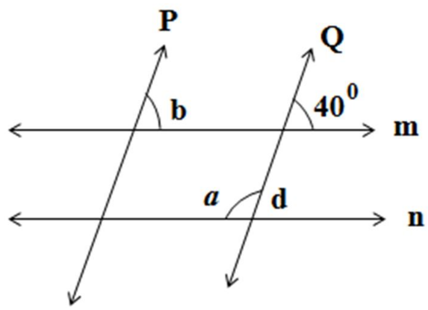
$4x = 160^0$

$x = \frac{160^0}{4}$

$x = 40^0$

Q.48) In the adjoining figure line *l* || line *m* and line *n* || line *P*.

To find $\angle a$, $\angle b$, $\angle d$. From the given measure of an angle complete the following activity. (3 mark)



Solution : line m || line n and line Q is the transversal.

$\angle d = \square$ ----- corresponding angle.

line P || line Q and line m is the transversal

$\angle b = \square$ ----- corresponding angle.

Now,

$\angle d + \angle a = 180^0$ ---- (Angle in linear pair)

$\square + \angle a = 180^0$

$\angle a = 180^0 - \square$

$\angle a = \square$

Solution –

line m || line n and line Q is the transversal.

$\angle d = \boxed{40^0}$ ----- corresponding angle.

line P || line Q and line m is the transversal

$\angle b = \boxed{40^0}$ -----(corresponding angle.)

Now,

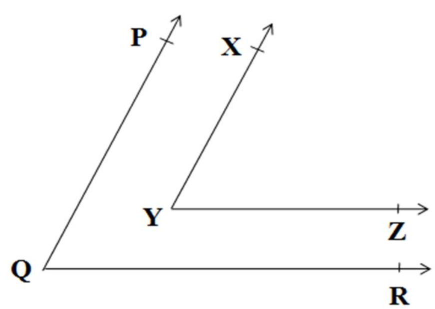
$\angle d + \angle a = 180^0$ ---- (Angle in linear pair)

$\boxed{40^0} + \angle a = 180^0$

$\angle a = 180^0 - \boxed{40^0}$

$\angle a = \boxed{140^0}$

Q.49) In the adjoining figure, sides of ∠ PQR and ∠XYZ are parallel to each other. Prove that ∠ PQR ≅ ∠ XYZ (3 mark)



Given- Ray YZ || Ray QR and

Ray YX || Ray QP.

To prove - ∠ PQR ≅ ∠ XYZ

Construction – Extend ray YZ in the opposite direction. It intersects ray QP at point S.

Proof – PQ || XY …. (Given)

PQ || XS and QR is the transversal.

∠ PQR = ☐ ...(I) ... (_____)

YZ || SR and XS is a transversal.

∠ XYZ ≅ ☐ ...(II) ... (_____)

From I and II,

∠ PQR ≅ ☐

Solution –

Given Ray YZ || Ray QR and Ray YX || Ray QP.

To prove - $\angle PQR \cong \angle XYZ$

Construction – Extend ray YZ in the opposite direction. It intersects ray QP at point S.

Proof – PQ || XY …. Given

PQ || XS and QR is the transversal.

$\angle PQR = \boxed{\angle XSR}$ ..(I) ... (Corresponding angle)

YZ || SR and XS is a transversal.

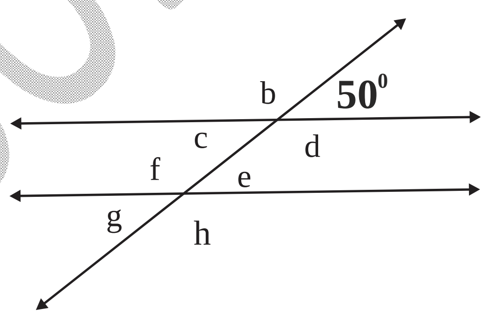
$\angle XYZ \cong \boxed{\angle XSR}$ --- II) (Corresponding angle)

From I and II,

$\angle PQR \cong \boxed{\angle XYZ}$

$\angle PQR \cong \angle XYZ$

Q.50) In the adjoining figure, if line P || line q and r is the transversal then find the value of c, e and h. -(3 mark)



$\angle C = \square$ --------- (Vertically opposite angle)

Now, line q || line r and line P is their transversal.

$\angle e = \square$ --------- (Alternate angle)

$\angle e = \square$

Now,

$\angle h + \angle e = 180^0$---- (Angles in a linear pair)

$\angle h = \square$

Solution -

$\angle C = \boxed{50^0}$ --------(Vertically opposite angle)

Now, line q || line r and line P is their transversal.

$\angle e = \boxed{\angle C}$ ---------- (Alternate angle)

$\angle e = \boxed{50^0}$

Now,

$\angle h + \angle e = 180^0$---- (Angles in a linear pair)

$\angle h + 50^0 = 180^0$

$\angle h = 180^0 - 50^0$

$\angle h = 130^0$

$\therefore \angle C = 130^0, \angle e = 50^0, \angle h = 130^0$