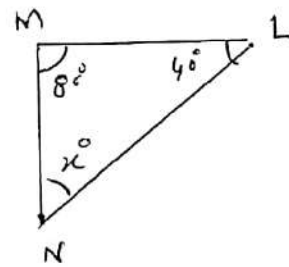
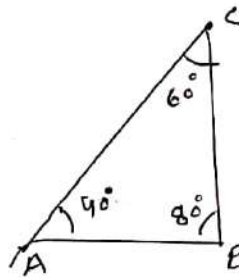


1. If  $\triangle ABC \cong \triangle LMN$ , then find the unknown "x"

Ans: Because two given  $\triangle$ s are  $\cong$  therefore

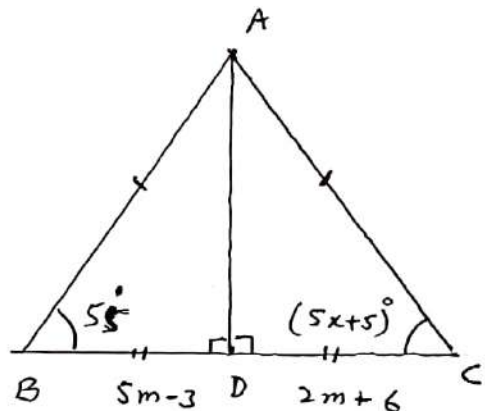
$$\angle N = x^\circ = 60^\circ$$



2. Find the value of unknowns for the given congruent  $\triangle$ s

Ans: Because  $\triangle ABD \cong \triangle ACD$

So  $(5x + 5)^\circ = 55^\circ$   
 $5x = 55 - 5^\circ$   
 $5x = 50^\circ$   
 $x = 10^\circ$

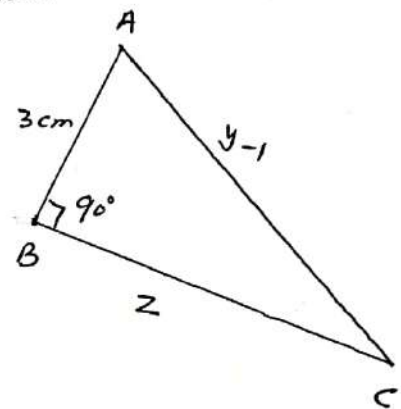
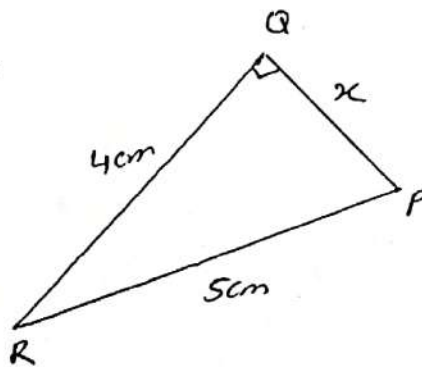


Also for value of "m"  $\overline{BD} \cong \overline{CD}$

$\therefore 5m - 3 = 2m + 6$   
 $5m - 2m = 6 + 3$   
 $3m = 9$   
 $m = 3$

3. If  $\triangle PQR \cong \triangle ABC$ , then find the unknowns

Ans: Because given  $\triangle$ s are  $\cong$ . Therefore corresponding sides and corresponding angles are  $\cong$ .



$$\overline{AC} = \overline{PR}$$

$$y - 1 = 5$$

$$y = 5 + 1$$

$$y = 6 \text{ cm}$$

$$\overline{BC} \cong \overline{QR}$$

$$z = 4 \text{ cm}$$

and

$$\overline{PQ} \cong \overline{AB}$$

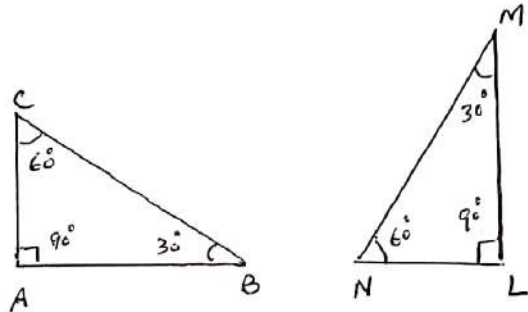
$$x = 3 \text{ cm}$$

Q4. If two angles of a  $\Delta$  are Congruent then what about their opposite sides.

Ans: If two angles of a  $\Delta$  are Congruent then the sides opposite to them are also Congruent.

Q5. If  $\Delta ABC \cong \Delta LMN$ , then

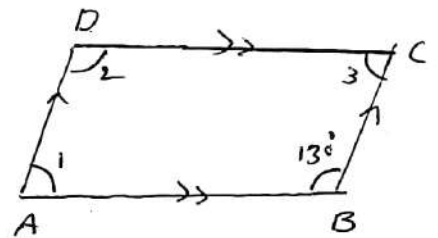
- i)  $m\angle N \cong m\angle C = 60^\circ$
- ii)  $m\angle M \cong m\angle B = 30^\circ$
- iii)  $m\angle A \cong m\angle L = 90^\circ$



Q6. If one angle of a  $\parallel gm$  (Parallelogram) is  $130^\circ$ . Find the measure of its remaining angles

Ans: Because in  $\parallel gm$  opposite angles are Equal

$$\therefore m\angle B = m\angle D = 130^\circ$$



Also

$$m\angle A + m\angle B = 180^\circ \quad (\text{Supplementary } \angle s)$$

$$m\angle A + 130^\circ = 180^\circ$$

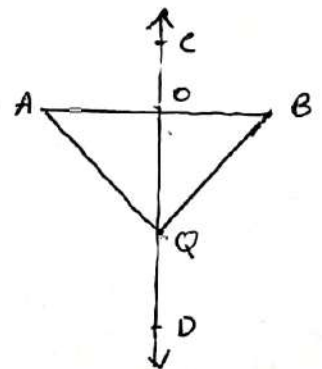
$$m\angle A = 180^\circ - 130^\circ = 50^\circ$$

Q7. What is the relation between the line segment joining the mid points of two sides of a triangle

Ans: The line segment, joining the mid-points of two sides of a triangle, is Parallel to the third side and is Equal to the half of its length.

Q8. If  $\overline{CD}$  is right bisector of line segment  $\overline{AB}$ ,

- Ans:
- i)  $m\overline{OA} = m\overline{OB}$  (Passing Through mid Points)
  - ii)  $m\overline{AQ} = m\overline{BQ}$  (Equidistant from End Point A and B)



Q9. Where will be the centre of circle passing through three non-collinear points? And why?

Ans: A, B and C are three non-collinear points which form a triangle ABC. The centre of circle will be at the concurrent point "O" of perpendicular bisectors of the triangle ABC.

Reason: Because centre "O" is equidistant from the end points of a  $\Delta$ .

Q10. Where do the right bisectors of the sides of a right angle triangle intersect each other?

Ans: The right bisectors of the sides of a right triangle intersect each other on the hypotenuse.

Q11. One exterior angle formed on producing one side of a parallelogram is  $40^\circ$ . Find the measures of its interior angles.

Ans:  $m\angle 1 + 40^\circ = 180^\circ$  (Supp  $\angle$ s)

$m\angle 1 = 180 - 40^\circ = \boxed{140^\circ}$

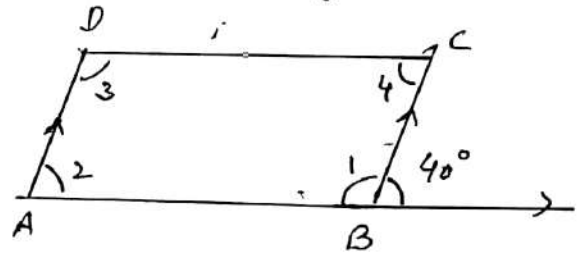
$m\angle 1 + m\angle 2 = 180^\circ$  (int supp  $\angle$ s)

$140^\circ + m\angle 2 = 180^\circ$

$m\angle 2 = 180^\circ - 140^\circ = \boxed{40^\circ}$

$m\angle 1 = m\angle 3 = \boxed{140^\circ}$  ( $\angle$  opposite  $\angle$ s of  $\parallel$  gm)

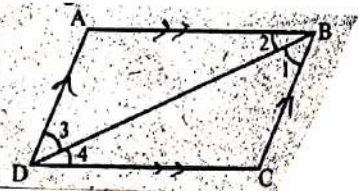
$m\angle 4 = m\angle 2 = \boxed{40^\circ}$  (opposite  $\angle$ s of  $\parallel$  gm)



12/  
Ex-11

In parallelogram ABCD

- (i)  $m\overline{AB} \cong m\overline{DC}$  (ii)  $m\overline{BC} \cong m\overline{AD}$   
 (iii)  $m\angle 1 \cong \dots$  (iv)  $m\angle 2 \cong \dots$



- Ans: (i)  $m\overline{AB} \cong m\overline{DC}$  (opposite sides are  $\cong$  to each other)  
 (ii)  $m\overline{BC} \cong m\overline{AD}$  ( " " " " )  
 (iii)  $m\angle 1 \cong m\angle 3$  (Alternate  $\angle$ s)  
 (iv)  $m\angle 2 \cong m\angle 4$  (Alternate  $\angle$ s)

13/ Find the unknowns in the given figure

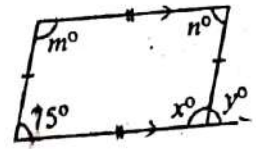
Ans:  $n^\circ = 75^\circ$  (opposite  $\angle$ s of  $\parallel$ gm)

$y^\circ = n^\circ = 75^\circ$  (Alternate  $\angle$ s)

$x^\circ + 75^\circ = 180^\circ$  (Supp  $\angle$ s)

$x^\circ = 180^\circ - 75^\circ = \boxed{105^\circ}$

$m^\circ = x^\circ = 105^\circ$  (opposite  $\angle$ s of  $\parallel$ gm)



14/ If the given figure ABCD is a Parallelogram, then find  $x$ ,  $m$

Ans:  $11x^\circ = 55^\circ$  (opposite  $\angle$ s of  $\parallel$ gm)

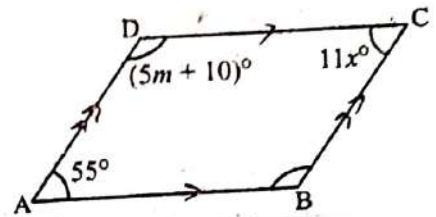
$x^\circ = \frac{55^\circ}{11} = \boxed{5^\circ}$

$5m + 10 + 55^\circ = 180^\circ$  (int Supp  $\angle$ s)

$5m + 65^\circ = 180^\circ$

$5m = 180^\circ - 65^\circ = 115^\circ$

$m = \frac{115^\circ}{5} = \boxed{23^\circ}$



15/ The given figure LMNP is a Parallelogram  
Find the value of "m", "n"

$4m + n = 10$  — (1)

$8m - 4n = 8$  — (2)

multiply Eq (1) by (4) and add in Eq (2)

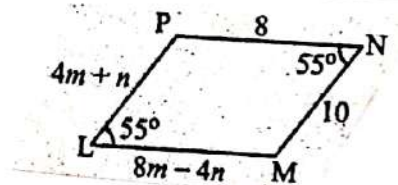
$16m + 4n = 40$

$8m - 4n = 8$

$24m = 48$

$m = \frac{48}{24}$

$\boxed{m = 2}$



Put value of  $m$  in Eq (1)

$4m + n = 10$

$4(2) + n = 10$

$8 + n = 10$

$n = 10 - 8$

$\boxed{n = 2}$

16/ Where do the right bisectors of the sides of ~~an~~ obtuse triangle intersect each other?

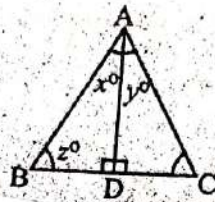
Ans: The right bisectors of the sides of an obtuse triangle intersect each other outside the triangle.

17/ What are you meant by the points of trisection of median?

Ans: The medians of a triangle are concurrent and their point of concurrency is called the point of trisection of each median.

18/

The given triangle ABC is equilateral triangle and AD is bisector of angle A, then find the values of unknowns  $x^\circ$ ,  $y^\circ$  and  $z^\circ$ .



Ans:

Because in equilateral triangle each angle =  $60^\circ$

$$\therefore z^\circ = 60^\circ$$

$$x^\circ + y^\circ = 60^\circ$$

$$30^\circ + y^\circ = 60^\circ$$

$$y^\circ = 60^\circ - 30^\circ = \boxed{30^\circ}$$

$$x^\circ + x^\circ + 90^\circ = 180^\circ$$

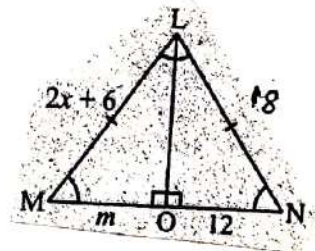
$$60^\circ + x^\circ + 90^\circ = 180^\circ$$

$$x^\circ + 150^\circ = 180^\circ$$

$$x^\circ = 180^\circ - 150^\circ$$

$$\boxed{x^\circ = 30^\circ}$$

19/ In the given congruent  $\Delta$ s LMO and LNO find the unknown 'x' and 'm'.



Ans: Because given that  $\Delta LMO \cong \Delta LNO$

$$\therefore m = 12 \quad (\text{Corresponding Sides of } \cong \Delta s)$$

$$2x + 6 = 18 \quad (\text{Corresponding Sides of } \cong \Delta s)$$

$$2x = 18 - 6$$

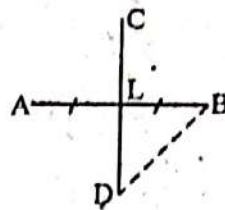
$$2x = 12$$

$$x = \frac{12}{2} = \boxed{6}$$

$\overline{CD}$  is right bisector of the line segment  $\overline{AB}$ .

(i) If  $m\overline{AB} = 6$  cm, then find the  $m\overline{AL}$  and  $m\overline{LB}$ .

(ii) If  $m\overline{BD} = 4$  cm, then find  $m\overline{AD}$ .



Ans: (i) Because  $\overline{CD}$  is the right bisector of  $\overline{AB}$

$$\therefore m\overline{AL} = \frac{m\overline{AB}}{2} = \frac{6}{2} = \boxed{3 \text{ cm}}$$

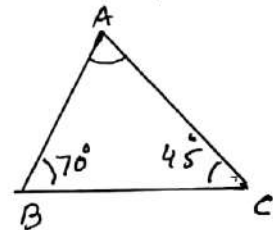
Also  $m\overline{LB} = m\overline{AL} = 3 \text{ cm}$

(ii)  $m\overline{AD} = m\overline{BD} = \boxed{4 \text{ cm}}$  (Point D is Equidistant from end points A and B)

21/ In the  $\triangle ABC$ ,  $m\angle B = 70^\circ$  and  $m\angle C = 45^\circ$ . Which of the sides of the triangle is longest and which is shortest.

Ans: i)  $m\overline{AC}$  is the longest side.

ii)  $m\overline{AB}$  is the shortest side.



23/ If two sides of a triangle are unequal in length. How will be the measure of their opposite ~~sides~~ angles?

Ans: If two sides of a triangle are unequal in length then the longer side has an angle of greater measure opposite to it.

24/ If two angles of a  $\triangle$  are unequal then what about their opposite sides.

Ans: If two angles of a  $\triangle$  are unequal in measure then the side opposite to the greater angle is greater than the side opposite to the smaller angle.

25/ Why 2 cm, 3 cm and 5 cm cannot be the sides of a triangle?

Ans: Because <sup>here</sup> sum of two sides ~~is~~ is not greater than the third side i.e.  $2 + 3 \not> 5$   
For length of a Sum of two sides should be greater than third side.

26/ If 10cm, 6cm and 8cm are the lengths of a triangle, then verify that sum of measure of two sides of a  $\Delta$ , is greater than the third side.

Ans: Check:

$$10 + 6 > 8 \quad \text{i.e.} \quad 16 > 8$$
$$10 + 8 > 6 \quad \text{i.e.} \quad 18 > 6$$
$$8 + 6 > 10 \quad \text{i.e.} \quad 14 > 10$$

Hence proved that sum of measure of any two sides is greater than the third side.

27/ what is the distance between a line and a point lying on it?

Ans: The distance between a line and a point lying on it is zero.

28/ what will be the angle for shortest distance from an outside point to the line?

Ans: The angle for the shortest distance from an outside point to the line will be  $90^\circ$ .

29/ If 13cm, 12cm and 5cm are the length of a triangle, then verify that difference of measures of any two sides of a triangle is less than the measure of the third side.

Ans Check:

$$13 - 12 < 5 \quad \text{i.e.} \quad 1 < 5$$
$$13 - 5 < 12 \quad \text{i.e.} \quad 8 < 12$$
$$12 - 5 < 13 \quad \text{i.e.} \quad 7 < 13$$

Hence proved that difference of measure of any two sides is less than the measure of the third side.

30/ 3cm, 4cm and 7cm are not the lengths of triangle give reasons?

Ans: Because <sup>here</sup> sum of two is not greater than the third side i.e.  $3 + 4 \not> 7$

For lengths of  $\Delta$  sum should be greater than third side.

31/ If 3cm and 4cm are lengths of two sides of right angle  $\Delta$  then what should be the third length of the triangle.

Ans:  $(3)^2 + (4)^2 = (x)^2$  (According to Pythagoras theorem)

$$9 + 16 = x^2$$

$$\sqrt{25} = \sqrt{x^2}$$

$$\boxed{5 = x}$$

32/ If  $a^2 + b^2 < c^2$  then what kind of triangle it is?

Ans: It is an obtuse angled  $\Delta$

33/ If  $a^2 + b^2 > c^2$  then what kind of triangle it is?

Ans: It is an acute angled  $\Delta$

34/ If  $a^2 + b^2 = c^2$  then what kind of triangle it is?  
It is a right angled  $\Delta$ .

35/ How many Mid Points line segment have?

Ans: The line segment have only one point.

36/ If two angles of a triangle are of  $35^\circ$  and  $85^\circ$ , then find the third angle.

Ans:  $35^\circ + 85^\circ + x = 180$  (Sum of angles of a  $\Delta = 180^\circ$ )

$$120 + x = 180^\circ$$

$$x = 180^\circ - 120^\circ = \boxed{60^\circ}$$

37/ In Parallelogram ABCD,  $mAB = 10\text{cm}$ . The altitude corresponding to sides AB and AD are respectively 7cm, 8cm. Find AD.

Ans: when base AB = 10cm  
Area of  $\parallel\text{gm} = \text{base} \times h$   
 $= 10 \times 7$  — (1)

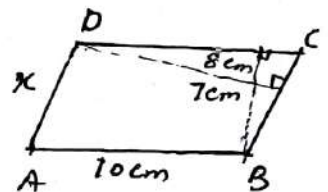
when AD is base  
Area of  $\parallel\text{gm} = \text{base} \times h$   
 $= x \times 8$  — (2)

From (1) and (2)  
We have

$$x \times 8 = 10 \times 7$$

$$x = \frac{10 \times 7}{8}$$

$$x = \frac{35}{4} = \boxed{8\frac{3}{4}}$$





38/ What a triangle is called if two sides are congruent?

Ans: The triangle is called an Isosceles triangle.

39/ when does the Area of Parallelogram and rectangle Equal?

Ans: The area of a Parallelogram is Equal to that of a rectangle on the same base and having the same altitude.

40/ If one angle of a right angle triangle is of  $45^\circ$ , then

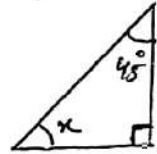
Ans: find third angle.

$$x^\circ + 45^\circ + 90^\circ = 180^\circ$$

$$x^\circ + 135^\circ = 180^\circ$$

$$x^\circ = 180^\circ - 135^\circ$$

$$\boxed{x^\circ = 45^\circ}$$



41/ If the line segment intersect the two sides of a triangle in the same ratio, what will be its relation to third side.

Ans: If the line segment intersect the two sides of a triangle in the same ratio then it will be Parallel to the third side.

42/ verify that triangle having given measure of sides is right angled  $\Delta$ .  $a = 5\text{ cm}$ ,  $b = 12\text{ cm}$  and  $c = 13\text{ cm}$

Ans:

$$c^2 = a^2 + b^2$$

$$(13)^2 = (5)^2 + (12)^2$$

$$169 = 25 + 144$$

$$\boxed{169 = 169}$$

43/ Find the unknown value of "x" in the given figure.

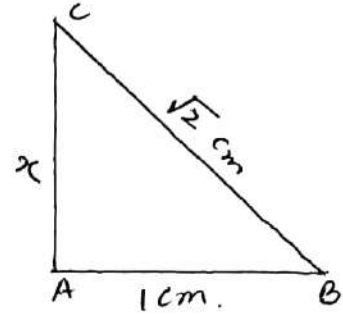
$$(\sqrt{2})^2 = (x)^2 + (1)^2$$

$$2 = x^2 + 1$$

$$2 - 1 = x^2$$

$$\sqrt{1} = \sqrt{x^2}$$

$$\boxed{1 = x}$$



44/ If hypotenuse of an isosceles right triangle is  $\sqrt{2}$  cm. then find the length of each of  $\Delta$ .

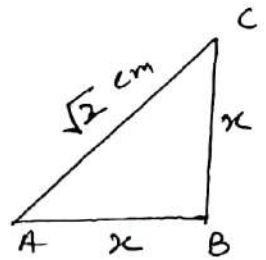
Ans:  $(x)^2 + (x)^2 = (\sqrt{2})^2$

$$2x^2 = 2$$

$$x^2 = \frac{2}{2} = 1$$

$$\sqrt{x^2} = \sqrt{1}$$

$$\boxed{x = 1}$$



45/ In isosceles  $\Delta PQR$  find the value of "x" and "y".

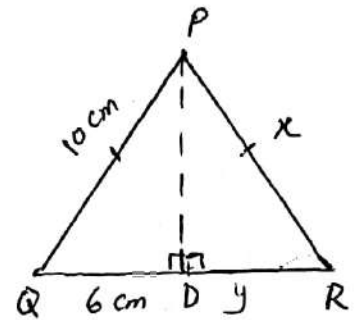
Ans: Because  $\Delta PQR$  is an isosceles  $\Delta$  so opposite sides are congruent.

$$\therefore \overline{PQ} \cong \overline{PR}$$

$$\boxed{10 = x}$$

$\overline{PD}$  is a Perpendicular Bisector

$$\therefore \boxed{y = 6 \text{ cm}}$$



46/ In a  $\Delta ABC$   $\overline{DE} \parallel \overline{BC}$  if  $\frac{AD}{BD} = \frac{3}{5}$  and  $\overline{AC} = 4.8 \text{ cm}$  then find  $\overline{AE}$

Ans:

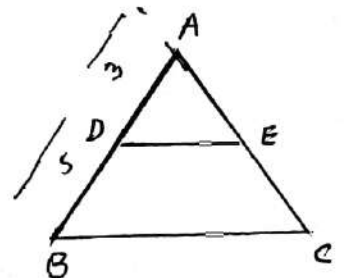
$$\frac{AD}{AB} = \frac{AE}{AC} \quad (\text{Ratio of } \overline{AB} \text{ is } 8)$$

$$\frac{3}{8} = \frac{AE}{4.8}$$

$$\frac{3}{8} \times 4.8 = AE$$

$$AE = 3 \times 0.6$$

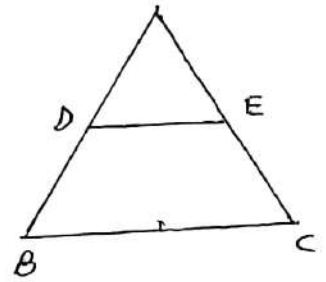
$$\boxed{AE = 1.8}$$



47/ If  $\overline{AD} = 2.4 \text{ cm}$ ,  $\overline{AE} = 3.2 \text{ cm}$ ,  $\overline{EC} = 4.8 \text{ cm}$ , then find  $\overline{BC}$

Ans:  $\frac{m\overline{AD}}{m\overline{BC}} = \frac{m\overline{AE}}{AC}$  ( $\overline{AC} = \overline{AE} + \overline{EC}$ )  
 ( $AC = 3.2 + 4.8$ )  
 ( $AC = 8$ )

$$\frac{2.4}{\overline{BC}} = \frac{3.2}{8}$$



$$8 \times \frac{2.4}{3.2} = \overline{BC}$$

$$6 = \overline{BC}$$

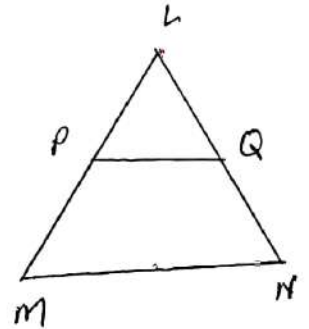
48/ If  $m\overline{LM} = 6 \text{ cm}$ ,  $m\overline{LQ} = 2.5 \text{ cm}$ ,  $\overline{QN} = 5 \text{ cm}$ , then find  $\overline{LP}$ .

Ans:  $\frac{\overline{LP}}{\overline{LM}} = \frac{\overline{LQ}}{\overline{LN}}$  ( $\overline{LN} = 2.5 + 5$ )  
 ( $\overline{LN} = 7.5 \text{ cm}$ )

$$\frac{\overline{LP}}{6} = \frac{2.5}{7.5}$$

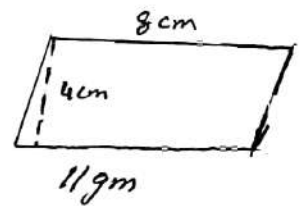
$$\overline{LP} = \frac{2.5}{7.5} \times 6$$

$$\overline{LP} = \frac{2.5}{7.5} \times 6^2 = \boxed{2}$$



49/ Find the Area of the following Diagram.

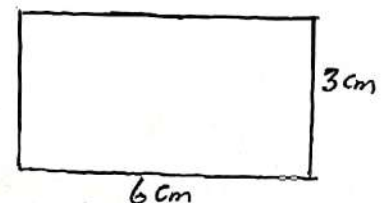
Ans(i) Area of  $\parallel \text{gm} = \text{base} \times h$   
 $= 8 \times 4 = \boxed{32 \text{ cm}^2}$



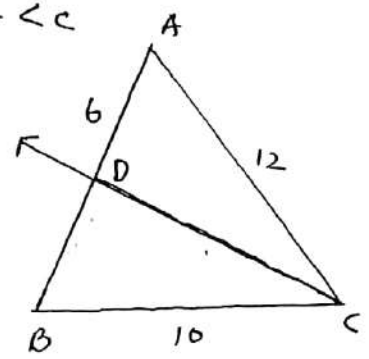
Ans(ii) Area of  $\Delta = \frac{1}{2} \text{ base} \times h$   
 $= \frac{1}{2} \times 16 \times 8 = \boxed{64 \text{ cm}^2}$



Ans(iii) Area of Rectangle =  $L \times B$   
 $= 6 \times 3$   
 $= \boxed{18 \text{ cm}^2}$



50/ In  $\triangle ABC$  as shown in figure,  $\overline{CD}$  bisect  $\angle C$  and meet  $\overline{AB}$  at  $D$ . Find  $m\overline{BD}$



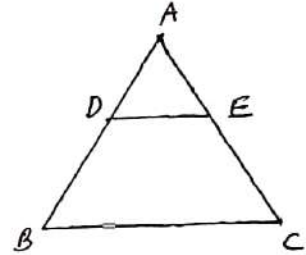
Ans:

$$\frac{\overline{BD}}{\overline{BC}} = \frac{\overline{AD}}{\overline{AC}}$$

$$\frac{\overline{BD}}{10} = \frac{6}{12}$$

$$BD = \frac{6 \times 10}{12} = \boxed{5}$$

51/ If  $\overline{AD} = 2.4$  cm,  $\overline{AE} = 3.2$  cm,  $\overline{DE} = 2$  cm,  $\overline{BC} = 5$  cm find  $\overline{AB}$  and  $\overline{AC}$



Ans:

$$\frac{\overline{AD}}{\overline{AB}} = \frac{\overline{DE}}{\overline{BC}}$$

$$\frac{2.4}{\overline{AB}} = \frac{2}{5}$$

$$5 \times \frac{2.4}{2} = \overline{AB}$$

$$5 \times 1.2 = \overline{AB}$$

$$\boxed{6 = \overline{AB}}$$

$$\frac{\overline{AC}}{\overline{AE}} = \frac{\overline{BC}}{\overline{DE}}$$

$$\frac{\overline{AC}}{3.2} = \frac{5}{2}$$

$$\overline{AC} = \frac{5 \times 3.2}{2}$$

$$= 5 \times 1.6 = \boxed{8 \text{ cm}}$$

52/ How many points determine a line and a plane?

Ans: Two points determine a line and three non-collinear points determine a plane.

53/ How does a bisector of internal angle of a triangle intersect the side opposite to it?

Ans: The internal bisector of an angle of a triangle divides the side opposite to it in the ratio of the length of the sides containing the angle.

54/ How many parts are there of a theorem? Name them.

Ans: Parts of theorems are (i) Diagram, (ii) given (iii) To Prove (iv) Construction (v) Proof.