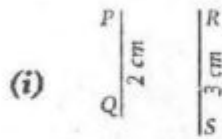


## UNIT 10

### GEOMETRY

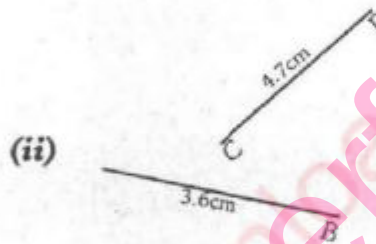
#### EXERCISE NO. 10.1

**Q.1** Find the sum of measures of the following pairs of line segments geometrically.



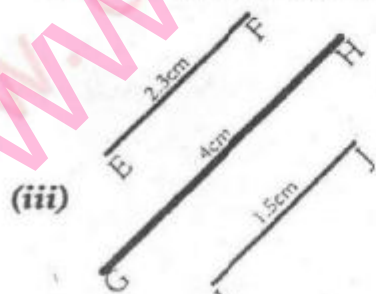
**Solution:**

$$\begin{aligned} \therefore PQ + RS &= \\ 2\text{ cm} + 3\text{ cm} &= 5\text{ cm} \\ \text{Sum} &= 5\text{ cm} \quad \text{Ans} \end{aligned}$$



**Solution:**

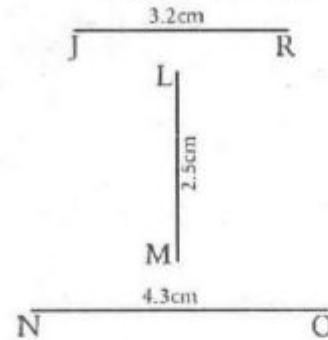
$$\begin{aligned} \therefore AB + CD &= \\ 3.6 + 4.7 &= 8.3\text{ cm} \\ \text{Sum} &= 8.3\text{ cm} \quad \text{Ans} \end{aligned}$$



**Solution:**

$$\begin{aligned}\therefore EF + GH + IJ \\ 2.3 + 4 + 1.5 &= 7.8 \\ \text{Sum} &= 7.8 \text{ cm. Ans}\end{aligned}$$

(iv)



**Solution:**

$$\begin{aligned}\therefore JR + LM + NO \\ 3.2 + 2.5 + 4.3 &= 10.0 \\ \text{Sum} &= 10.0 \text{ cm Ans}\end{aligned}$$

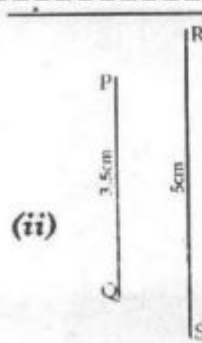
**Q.2** Find the difference of measures of the following line segments geometrically.

(i)



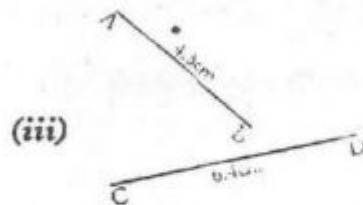
**Solution:**

$$\begin{aligned}\therefore OP - LM \\ \Rightarrow 4 - 2 &= 2 \\ \text{Difference} &= 2 \text{ cm Ans}\end{aligned}$$



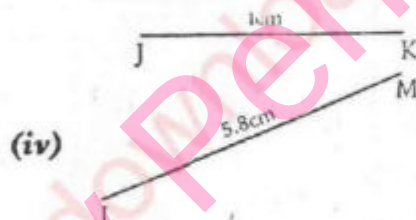
**Solution:**

$$\begin{aligned} \therefore RS - PQ \\ \Rightarrow 5 - 3.5 = 1.5 \\ \text{Difference} = 1.5 \text{ cm} \quad \text{Ans} \end{aligned}$$



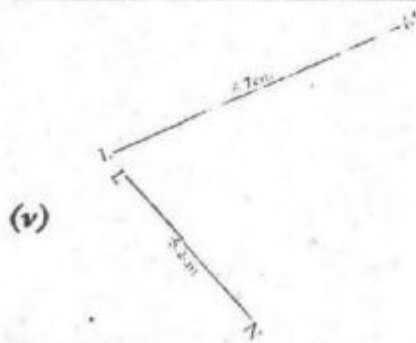
**Solution:**

$$\begin{aligned} \therefore CD - AB = \\ \Rightarrow 6.4 - 4.3 = 2.1 \text{ cm} \\ \text{Difference} = 2.1 \text{ cm} \quad \text{Ans} \end{aligned}$$



**Solution:**

$$\begin{aligned} \therefore LM - JK = \\ \Rightarrow 5.8 - 4 \text{ cm} = 1.8 \\ = 1.8 \text{ cm} \\ \text{Difference} = 1.8 \text{ cm} \quad \text{Ans} \end{aligned}$$



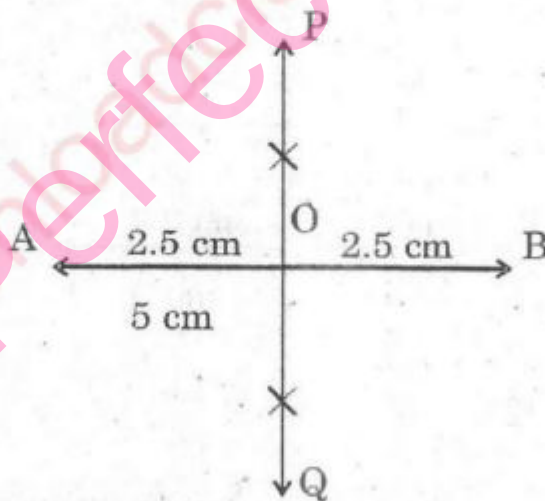
**Solution:**

$$\begin{aligned} \therefore \overline{LM} - \overline{LN} &= \\ \Rightarrow 6.7 \text{ cm} - 5.2 \text{ cm} &= 1.5 \text{ cm} \\ \text{Difference} &= 1.5 \text{ cm} \quad \text{Ans} \end{aligned}$$

**Q.3** Draw right bisectors of the line segments of the following measures.

(i) 5 cm

**Solution:**



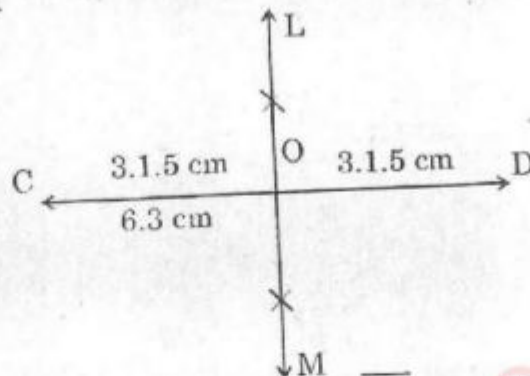
$\overleftrightarrow{PQ}$  is the required right bisectors of  $AB$ , therefore

$$\overline{AB} = 5 \text{ cm}$$

$$\overline{OA} = \overline{OB} = 2.5 \text{ cm} \quad \text{Ans}$$

(ii) 6.3 cm

Solution:



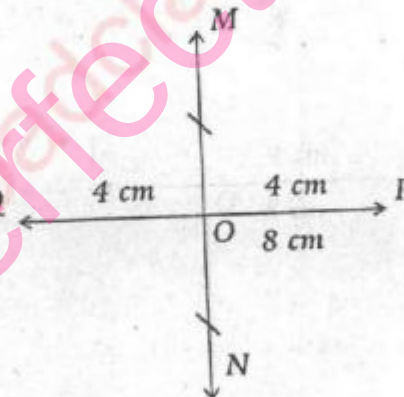
$\overleftrightarrow{LM}$  is the origin bisector of  $CD$  therefore,  
right bisectors of  $CD$

$$CD = 6.3 \text{ cm}$$

$$OC = OD = 3.15 \text{ cm} \quad \text{Ans}$$

(iii) 8 cm.

Solution:

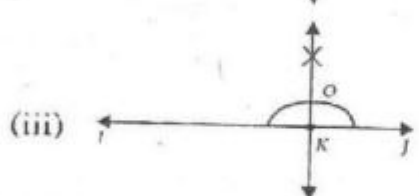
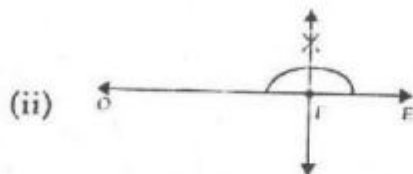
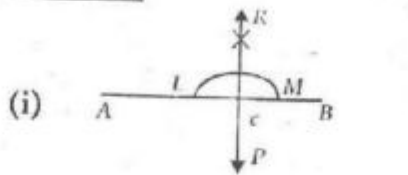


$$PQ = 8 \text{ cm}$$

$$OP = OQ = 4 \text{ cm} \quad \text{Ans}$$

**Q.4** Draw perpendicular from given points on the following line segments.

**Solution**



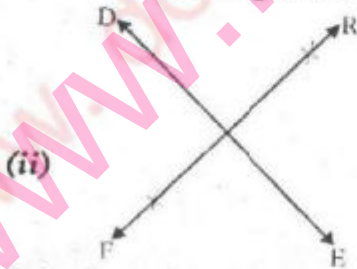
Ans

**Q.5** Draw perpendiculars from points from given points outside the following line segments.



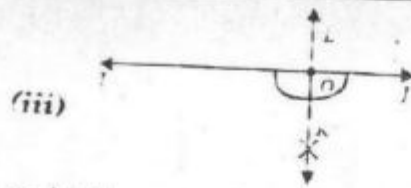
**Solution:**

$\overleftrightarrow{CD}$  is the required perpendicular of  $\overleftrightarrow{AB}$  from a point C outside it.



**Solution**

$\overleftrightarrow{RF}$  is the perpendicular on  $\overleftrightarrow{DE}$  from outside



Solution:

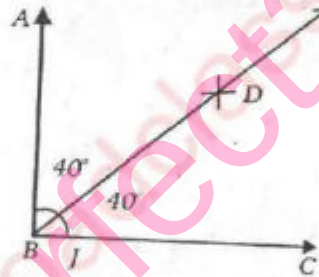
$\overline{LK}$  is the required perpendicular of  $\overline{IJ}$  from a point  $K$  outside it.

## EXERCISE 10.2

**Q.1** Bisector the following angles with the help of compasses.

(i)  $80^\circ$

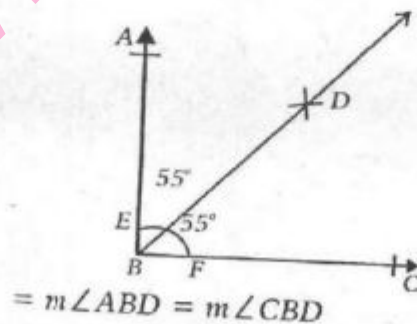
Solution:



Ans:  $m\angle ABD = m\angle CBD$   
 $m\angle ABD = 40^\circ$  &  $m\angle CBD = 40^\circ$

(ii)  $110^\circ$

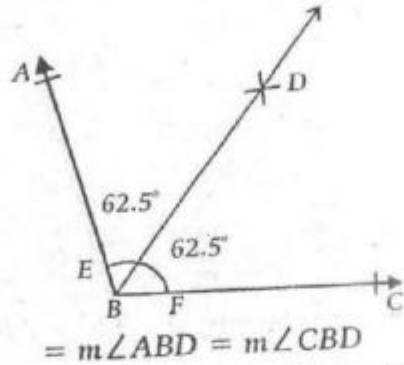
Solution:



191 a  $m\angle ABD = 55^\circ$  and  $m\angle CBD = 55^\circ$  Ans

(iii)  $125^\circ$

Solution:

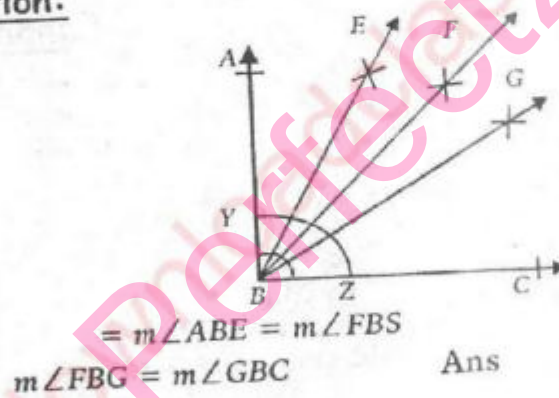


Ans

**Q.2** Divide the following angles with the help of compasses into four equal angles.

(i)  $95^\circ$

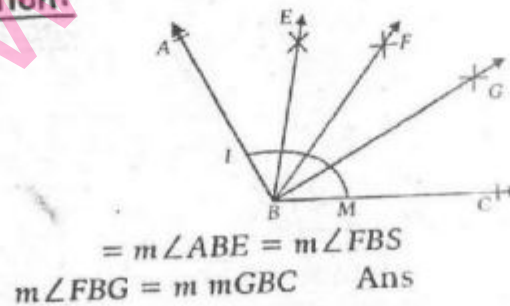
Solution:



Ans

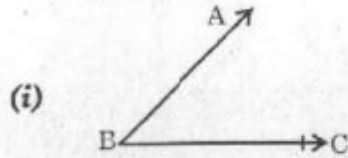
(ii)  $115^\circ$

Solution:

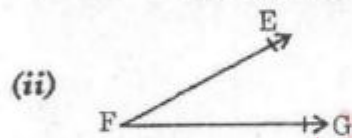
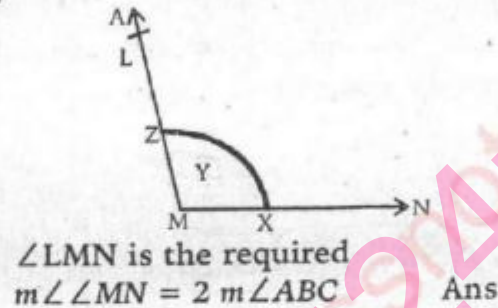


Ans

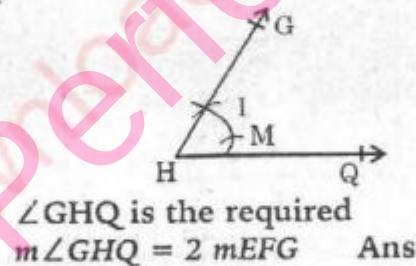
**Q.3** Draw the angle of equal measures and twice of the following angles with the help of pair of compass and ruler. Check your answers with protractor.



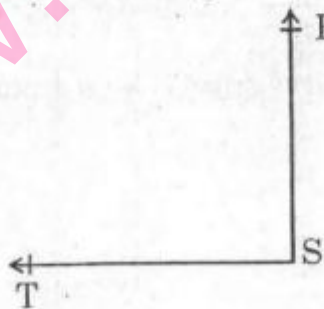
Solution:



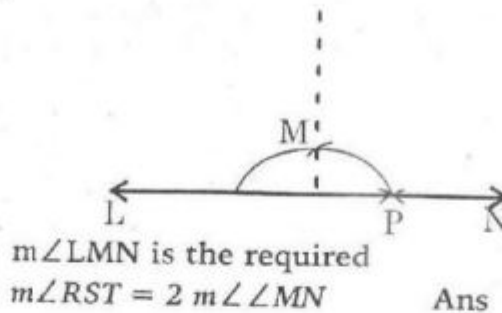
Solution:



(iii)



Solution:

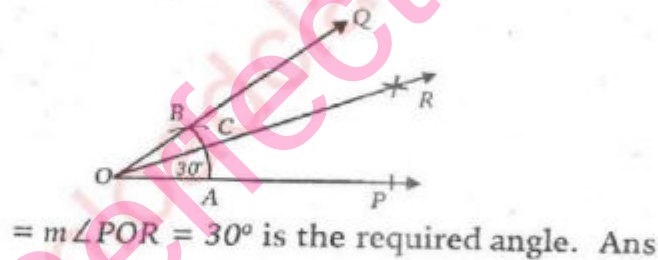


**Q.4** Draw the following angles with the help of pair of compasses and ruler.

(i)  $30^\circ$

Solution:

As  $\frac{60^\circ}{2} = 30^\circ$ , so we construct an angle of  $60^\circ$  and bisect it in two equal angles of  $30^\circ$ .



(ii)  $\left(22\frac{1}{2}\right)^\circ$       (iii)  $\left(67\frac{1}{2}\right)^\circ$       (iv)  $75^\circ$

(v)  $105^\circ$       (vi)  $120^\circ$       (vii)  $135^\circ$       (viii)  $165^\circ$

Solution:

Draw yourself from observing text book from (ii) to (viii).

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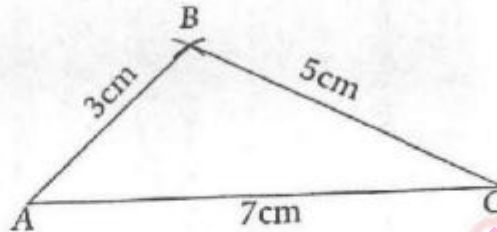
### EXERCISE 10.3

---

Q.1 Construct a triangle ABC when:

$mAB = 3\text{ cm}$ ,  $mBC = 5\text{ cm}$ ,  $mCA = 7\text{ cm}$

Solution:



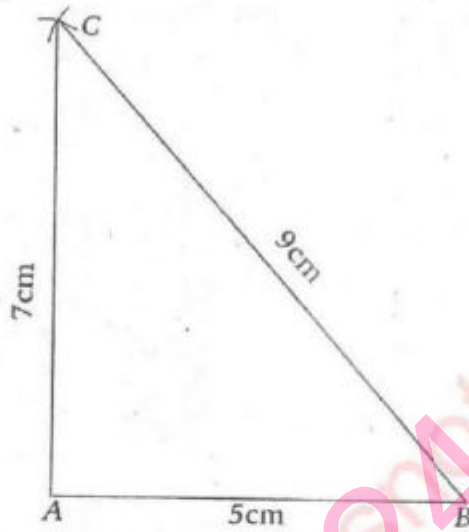
Q.2  $mAB = 2\text{ cm}$ ,  $mBC = 5\text{ cm}$ ,  $mCA = 5\text{ cm}$ .

Solution:



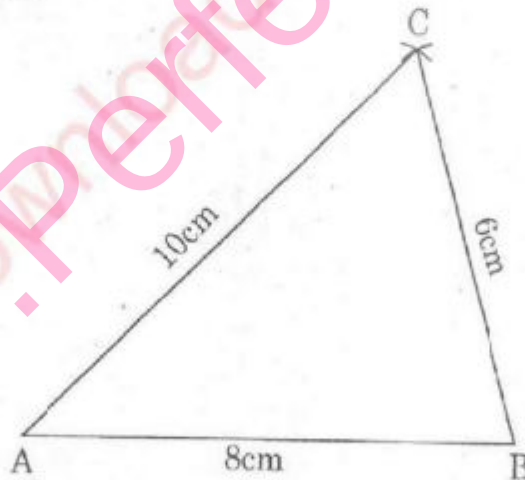
Q.3  $mAB = 5\text{cm}$ ,  $mBC = 7\text{cm}$  and  $CA = 9\text{cm}$ .

Solution:



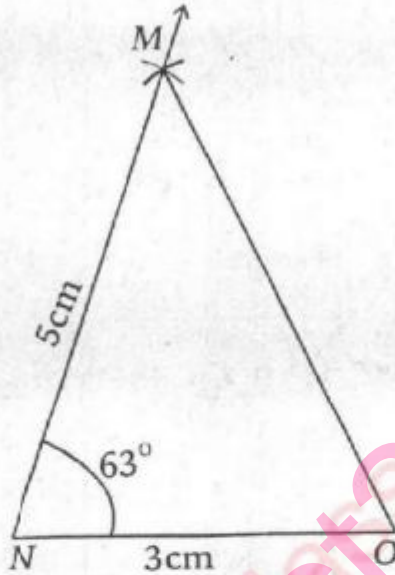
Q.4.  $mAB = 8\text{cm}$   
 $mBC = 6\text{cm}$   
 $mCA = 10\text{cm}$

Solution:



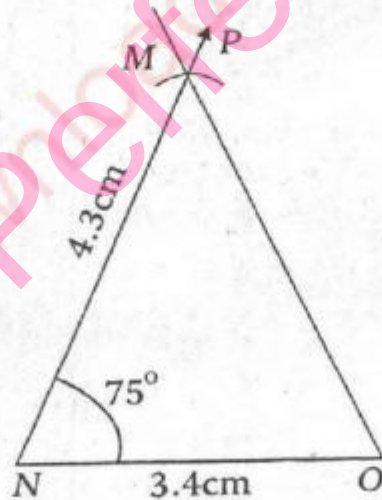
Q.5. Construct a triangle  $MNO$  when.  $m\angle N = 63^\circ$ ,  
 $mNO = 3\text{cm}$  and  $mMN = 5\text{cm}$ .

Solution:



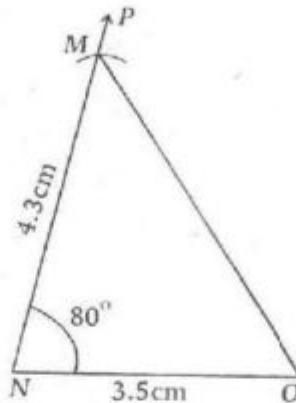
Q.6  $m\angle N = 75^\circ$ ,  $mNO = 3.4\text{ cm}$ ,  $mMN = 4.3\text{ cm}$

Solution:



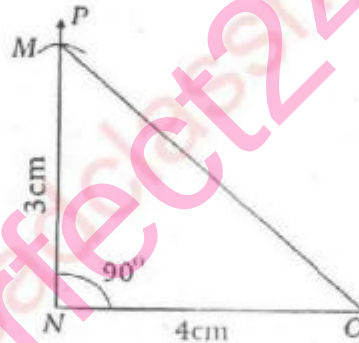
Q.7  $m\angle 80^\circ$ ,  $mNO = 3.5$ ,  $mMN = 4.3\text{cm}$

Solution:



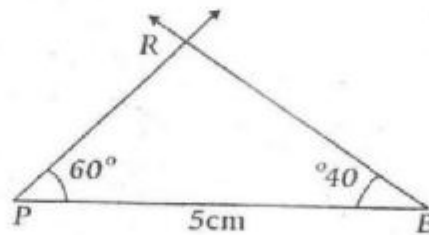
Q.8  $m\angle N = 90^\circ$ ,  $mNO = 4\text{cm}$ ,  $mMN = 3\text{cm}$ .

Solution:



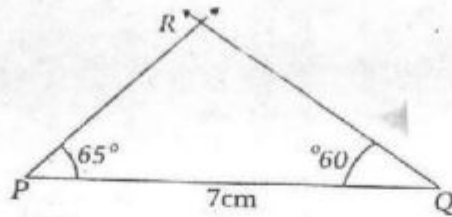
Q.9 Construct a triangle PQR when  $mPQ = 5\text{cm}$   
 $m\angle Q = 40^\circ$ ,  $m\angle P = 60^\circ$ .

Solution:



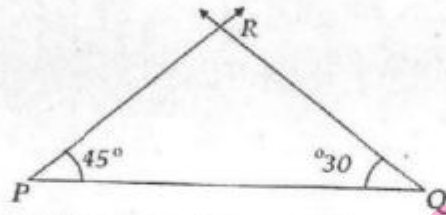
Q.10  $mPQ = 7\text{cm}$ ,  $m\angle P = 65^\circ$ ,  $m\angle Q = 60^\circ$ .

Solution:



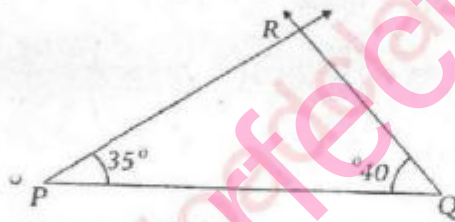
Q.11  $mQR = 6.5\text{ cm}$ ,  $m\angle Q = 45^\circ$ ,  $m\angle R = 30^\circ$ .

Solution:

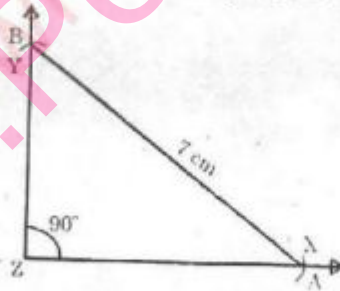


Q.12  $mQR = 7.5\text{ cm}$ ,  $m\angle Q = 35^\circ$ ,  $m\angle R = 40^\circ$ .

Solution:

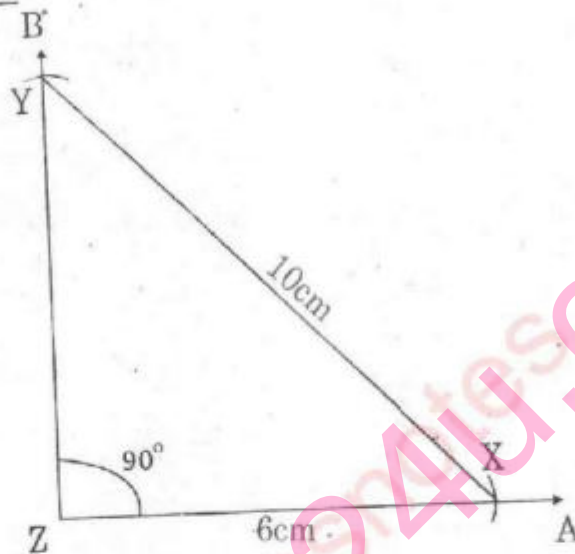


Q.13 Construct a right angled triangle XYZ when  $m\angle Z = 90^\circ$ ,  $mXY = 7\text{cm}$ ,  $mXZ = 5\text{cm}$ .



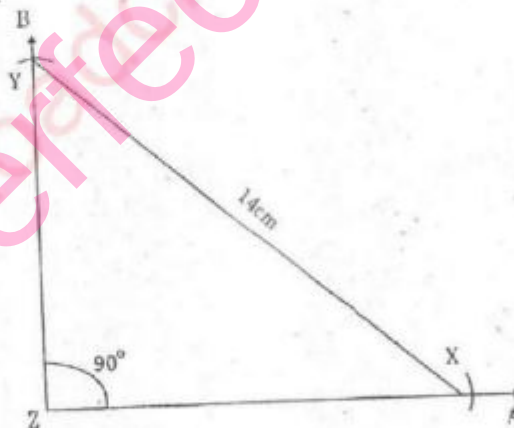
Q.14  $mXY = 10\text{cm}$ ,  $mXZ = 6\text{cm}$ .

Solution:



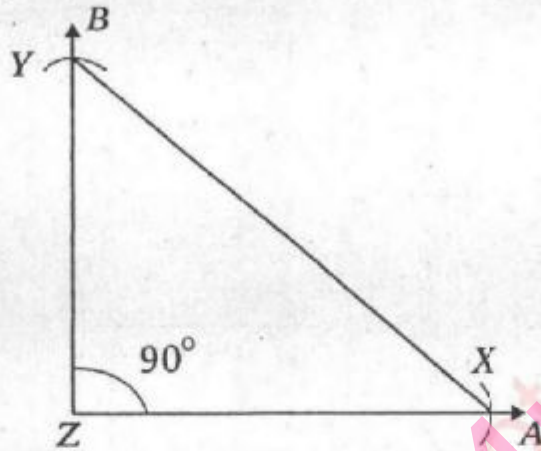
Q.15  $mXY = 14\text{cm}$ ,  $mXZ = 10\text{cm}$ .

Solution:



Q.16  $m\angle XY = 8\text{cm}$ ,  $m\angle XZ = 6.5\text{cm}$ .

Solution:



### REVIEW EXERCISE 10

Q.1 Give four examples of objects which represent the line segments from your environment.

Solution:

The examples of line segments are following.

- (i) door                      (ii) copy
- (iii) Table                      (iv) board

Q.2 If  $mAB = 4.3\text{cm}$ ,  $mCD = 3.5\text{cm}$  and  $mEF = 2\text{cm}$  construct geometrically a line segment whose length is equal to:

- (i)  $mAB + mCD + mEF$ .

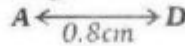
Solution:

$$\begin{aligned} & \text{Line segment} = 9.8\text{cm} \\ & A \longleftarrow \text{-----} \longrightarrow B \\ & mAB + mCD + mEF = \\ & 4.3\text{cm} + 3.5\text{cm} + 2\text{cm} = 9.8\text{cm}. \end{aligned}$$

(ii)  $mAB - mCD$

Solution:

Line Segment = 0.8cm

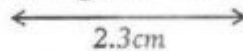


$$mAB - mCD = 4.3\text{cm} - 3.5\text{cm} = 0.8\text{cm}$$

(iii)  $mAB - mEF$

Solution:

Line Segment = 2.3cm

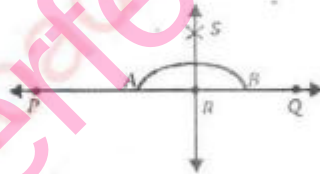


$$mAB - mEF = 4.3\text{cm} - 2\text{cm} = 2.3\text{cm}$$

**Q.3** Draw a line segment measuring 7.6cm and draw its right bisector. Then bisect its each part into equal parts.

Solution:

RS is the required perpendicular to PQ from a point from it.

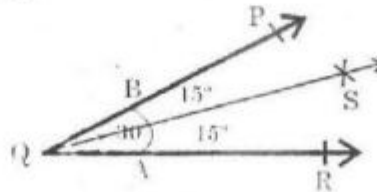


**Q.4** Draw angles of the following measures with the help of compasses and bisect them.

(i)  $30^\circ$

Solution:

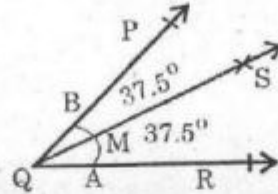
$\overrightarrow{QS}$  bisect  $\angle PQR$  in two equal i.e  $m\angle PQS = 15^\circ$  and  $m\angle RQS = 15^\circ$



(ii)  $75^\circ$

Solution:

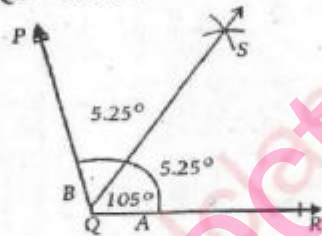
—  $\overrightarrow{QS}$  bisect  $\angle PQR$  in two equal i.e  $m\angle PQS$  and  $m\angle RQS = 37.5$



(iii)  $105^\circ$

Solution:

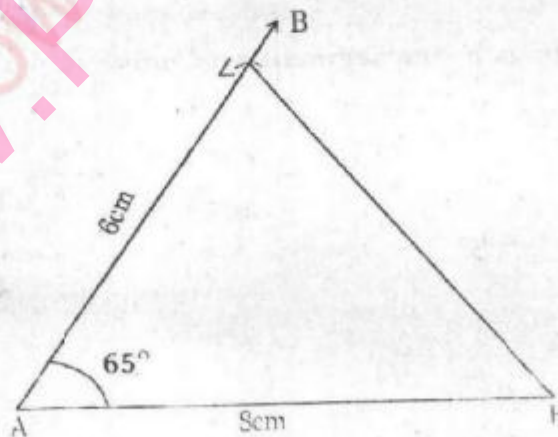
$\overrightarrow{QS}$  bisects  $\angle PQR$  in two equal angles in  $m\angle PQS = 52.5^\circ$  and  $m\angle RQS = 52.5^\circ$ .



**Q.5. Construct a triangle ABC according to the following conditions and unite steps of construction in each case.**

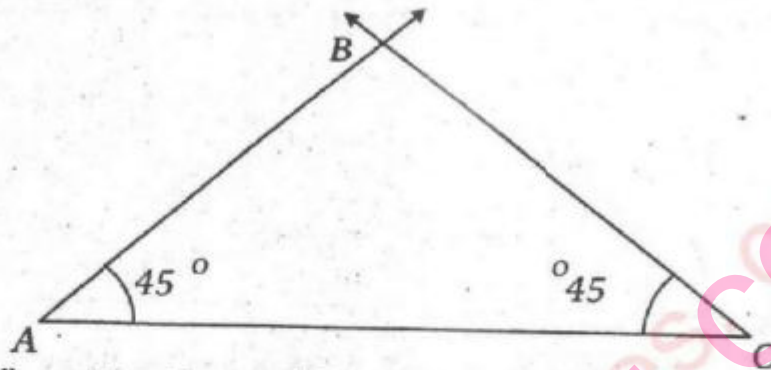
(i)  $mAB = 8\text{cm}$ ,  $mAC = 6\text{cm}$ ,  $m\angle A = 65^\circ$ .

Solution



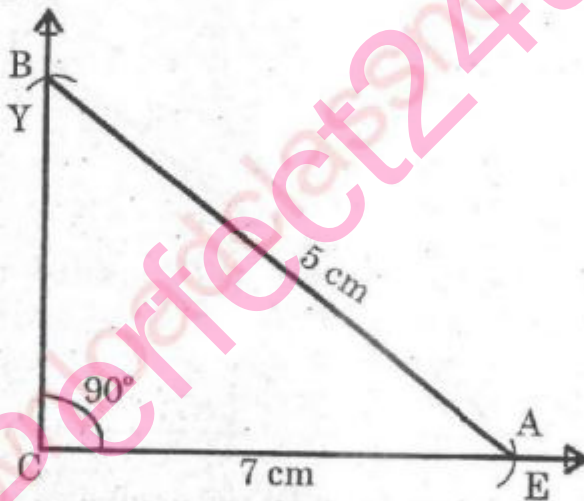
(ii)  $m\angle A = 45^\circ$ ,  $m\angle C = 45^\circ$ ,  $mAC = 7.5\text{cm}$

Solution



(iii)  $mAB = 5\text{cm}$ ,  $mAC = 7\text{cm}$ ,  $m\angle B = 90^\circ$

Solution

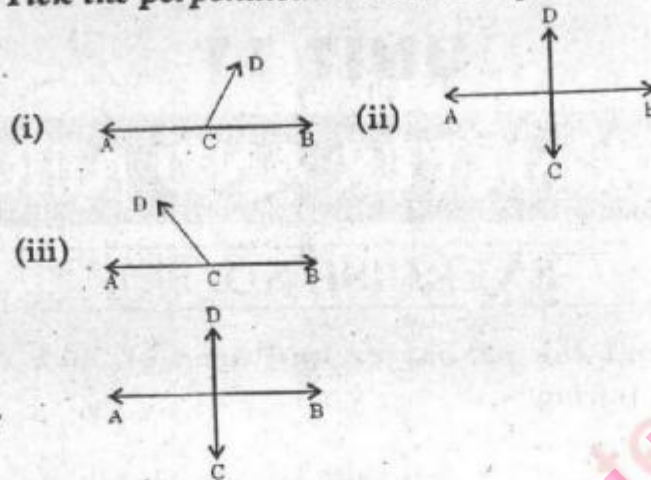


Q.6 Draw a line segment and name it.

Solution:



**Q.7 Tick the perpendicular bisector of a line A.**



**Q.8. Choose the correct answer:**

- (i) Line segment  $AB$  is denoted by:  
 (a)  $\overleftrightarrow{AB}$  ☒ (b)  $AB$  (c)  $\overrightarrow{AB}$  (d)  $\overrightarrow{BA}$
- (ii) Bisector divides a line segment into \_\_\_\_\_ equal parts.  
 (a) two ☒ (b) three (c) four (d) five
- (iii) In  $PQ$ , the right bisector passes through its:  
 (a) end point (b) mid point ☒  
 (c) point P (d) point Q
- (iv) An angle is measured by:  
 (a) Ruler (b) Compasses  
 (c) Protractor ☒ (d) Set squares

**Q.9. Write True (T) or False (F) for the following:**

- (i) A line has a definite length. (False)  
 (ii) A ray has two end points. (False)  
 (iii) An angle of  $15^\circ$  is formed by bisecting the angle of  $30^\circ$ . (True)  
 (iv) A triangle has 6 elements. (True)  
 (v) A triangle is formed when sum of measures of any two sides is less than the third side. (False)

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