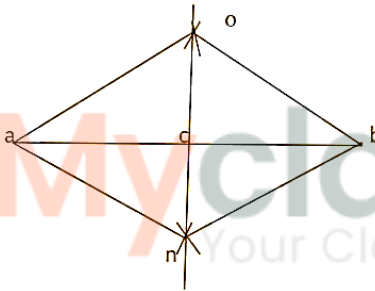

GEMETRICAL CONSTRUCTION - CHAPTER- 13

EXERCISE 13

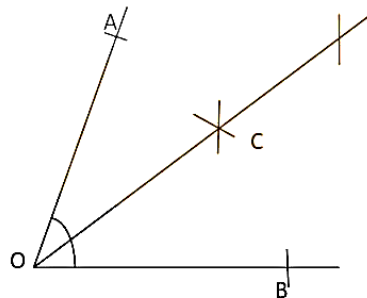
ANSWER1

- (i) Draw a line segment 5.6 AB
- (ii) Suppose with A as centre and a radius equal to more than half of AB, draw 2 arcs , one below the AB & one above the AB.
- (iii) Suppose with B as centre and same radius , draw 2 arcs , cutting the previously drawn arcs at points O and N respectively
- (iv) Join ON, intersecting AB at a C. then ON is the required perpendicular bisector of AB at point C.

On measuring we get ,
CA = 2.8 and CD = 2.8
Also. Right angle Δ
 $\angle ACO = \angle BCO = 90^\circ$



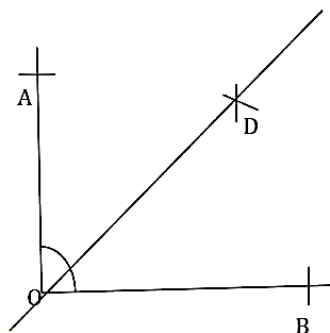
ANSWER2



(rough idea)

- (i) Draw a line OB
- (ii) With taking center as O , with the help protractor draw arc at 80°
- (iii) Now taking O as center , using of compass draw an intersecting arc at C.
- (iv) Draw a straight line to join OC. Here, $\angle AOB = 80^\circ$
After bisection of $\angle O$, we get the $1/2\angle O = 40^\circ$
 $\angle AOC = \angle BOC = 40^\circ$

ANSWER3



- (i) Draw a line OB
 - (ii) With taking center as O , with the help protractor draw arc at 90°
 - (iii) Now taking O as center , using of compass draw an intersecting arc at D.
 - (iv) Draw a straight line to join, OD , here angle is equally divided into 2 parts
- So, $\angle AOB = 90^\circ$
 $1/2\angle AOB = 45^\circ$

ANSWER4

Construct angles should be down by ruler and compasses.

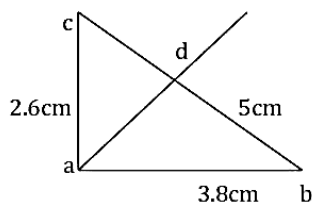
ANSWER5

Rough idea

In $\triangle ABC$, Given $BC = 5\text{cm}$, $AB = 3.8\text{cm}$, $AC = 2.6\text{cm}$

- (i) Draw a line segment $AB = 3.8\text{cm}$
- (ii) With A as center draw radius of 2.6 at point C draw an arc
- (iii) With B as centre draw line of radius of 5cm , draw another arc cut the previous one.
- (iv) Join AC, BC , Then $\triangle ABC$ is the required.
- (v) Clearly, the opp angle is the largest one, so $\angle B$ is the largest one.
- (vi) So, we draw BD , the bisector of $\angle B$.

On measuring we find that $\angle ABD = \angle CBD = 20^\circ$



ANSWER6

Rough idea

- (i) Draw line segment $BC = 4.8\text{cm}$ (base of the triangle)
- (ii) With B as center draw an angle of 45° as given $\angle B = 45^\circ$
- (iii) With c as center draw an angle of 75° as given $\angle C = 75^\circ$
- (iv) So, there is point where both angle is intersect each other, that point will be A or A° .
- (v) Join lines to make $\triangle ABC$.

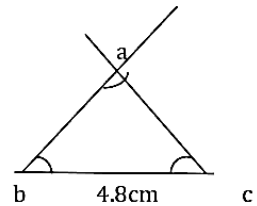
As we know that , sum of the all angles of a triangle be 180°

$$\angle A + \angle B + \angle C = 180$$

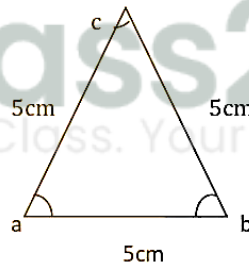
$$\angle A + 45 + 75 = 180$$

$$\angle A = 180 - 45 - 75$$

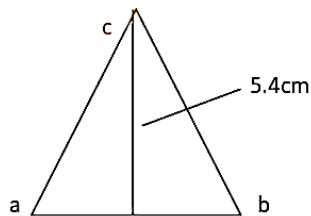
$$\angle A = 60^\circ$$

**ANSWER7**

- (i) Draw a line AB of radius of 5cm (given)
- (ii) With A as centre draw an arc at C of radius 5cm.
- (iii) With B as centre draw an arc at C of radius 5cm
- (iv) Join all the point We get $\triangle ABC$
All the angles will be 60°

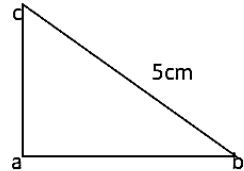
**ANSWER8**

- (i) Draw a line AB. (suppose)
- (ii) With A as centre draw an arc at C.
- (iii) With B as centre draw an arc at C.
- (iv) On line $AB \perp CD$, where $CD = 5.4\text{cm}$
So, $AD = DB$ and $AC = CB$



ANSWER9

- (i) Draw a line of length 4.5cm as AB
- (ii) With as centre A draw 90° angle to C.
- (iii) With as centre B draw hypotenuse of 5cm at C.
- (iv) Join, AC and BC.

**ANSWER10**

given, In $\triangle ABC$,

$BC=4.5\text{cm}$, $\angle B=45^\circ$ and $AB+AC = 8\text{cm}$.

$\therefore (AB + AC) < BC$

Thus, the sum of two sides of the triangle is not greater than the third side.

Hence, the construction of $\triangle ABC$ is not possible.

ANSWER11

Given, In $\triangle ABC$

$AB=5.8\text{cm}$, $\angle B = 60^\circ$ and $BC+CA = 8.4\text{cm}$

$\therefore (BC + CA) > AC$

Thus, the sum of two sides of the triangle is not greater than the third side.

Hence, the construction of $\triangle ABC$ is possible.

ANSWER12

Given, In $\triangle ABC$

$BC=6\text{cm}$, $\angle B=30^\circ$ and $AB-AC=3.5\text{cm}$

$\therefore (AB + AC) > BC$

Thus, the difference of two sides of the triangle is not less than the third side.

Hence, the construction of $\triangle ABC$ is not possible.

ANSWER13

In given $\triangle ABC$

$AB=5\text{cm}$, $\angle A=30^\circ$, $AC-BC = 2.5\text{cm}$

$\therefore (AC - BC) < AB$

Thus, the difference of two sides of the triangle is not less than the third side.

Hence, the construction of $\triangle ABC$ is not possible.

ANSWER14

- (i) Draw a line segment $XY=12\text{cm}$
- (ii) Draw a ray XZ , making an acute angle with XY and drawn in the downward direction.
- (iii) From x , set off $(3+2+4)=9$ equal distances along XZ .
- (iv) Mark points L, M, N on XZ such that $XL=3$ Units, $LM = 3$ units and $MN = 4$ units
- (v) Join NY
- (vi) Draw $LB \parallel NY$ and $MC \parallel NY$, cutting XY at B and C respectively,
- (vii) With B as centre and radius CY draw another arc, cutting the previous arc at A .
- (viii) Join AB and AC .

Then, $\triangle ABC$ is required triangle.

Verification:

On measuring, we find that

$AB = 4.5\text{cm}$, $BC = 3\text{cm}$, $CA = 6\text{cm}$

$$\begin{aligned}\therefore AB:BC:CA &= 9/2:3:6 \\ &= 9:6:12 \\ &= 3:2:4\end{aligned}$$

ANSWER15

- (i) Draw a line segment = 10.4cm
 - (ii) Make $\angle PQR = 45^\circ$ and $\angle PQS = 120^\circ$
 - (iii) Draw the bisectors of $\angle QPR$ and $\angle PQS$ to meet A.
 - (iv) Draw the perpendicular bisectors of PA and QA to meet PQ at B and C resp.
 - (v) Join AB and AC
- Then, $\triangle ABC$ is the required triangle.

ANSWER16

- (i) Draw a line segment = 11.6cm
 - (ii) Make $\angle PQR = 45^\circ$ and $\angle PQS = 60^\circ$
 - (iii) Draw the bisectors of $\angle QPR$ and $\angle PQS$ to meet A.
 - (iv) Draw the perpendicular bisectors of PA and QA to meet PQ at B and C resp.
 - (v) Join AB and AC
- Then, $\triangle ABC$ is the required triangle.

ANSWER17

- (i) given, In $\triangle ABC$,
 $AB = 6\text{cm}$, $\angle A = 40^\circ$ and $BC + AC = 5.8\text{cm}$.
 $\therefore (BC + AC) < AB$
Thus, the sum of two sides of the triangle is not greater than the third side.
Hence, the construction of $\triangle ABC$ is not possible

- (ii) In given $\triangle ABC$
 $AB = 7\text{cm}$, $\angle A = 50^\circ$, $BC - AC = 2.5\text{cm}$
 $\therefore (BC - AC) < AB$
Thus, the difference of two sides of the triangle is not less than the third side.
Hence, the construction of $\triangle ABC$ is not possible.

- (iii) In given $\triangle ABC$, $BC = 5\text{cm}$ and $\angle A = 60^\circ$, $\angle B = 80^\circ$, $\angle C = 50^\circ$
As we know that sum of all the angles will be 180°
So, $\angle A + \angle B + \angle C \leq 180^\circ$
 $60 + 80 + 50 \neq 180$
 $190 \neq 180$
Hence, the construction of $\triangle ABC$ is not possible

(iv) Here, $(AB + BC) = (4+3)$ and $AC = 7\text{cm}$ (given)

$$\therefore (AB+BC) = AC$$

Thus, the sum of two sides is not greater than the third side.

Hence, the construction of $\triangle ABC$ is not possible.

ANSWER18

We can also think as $67.5 = \frac{1}{2} \times 135$
 $= \frac{1}{2} \times (90 + 45)$

ANSWER19

- (i) Draw a line of 4cm on line segment AB
- (ii) With A as centre draw a arc of 4cm at point C i.e perpendicular on point A.
- (iii) With B as centre draw a arc of 4cm at point D i.e perpendicular on point B
- (iv) With C as centre draw a arc of 4cm point D . which intersection at same distance at D point
- (v) Join all the lines AC,CD,BD

ANSWER20

- (i) Draw a line segment $BC = 3.5\text{cm}$
- (ii) Construct $\angle CBX = 90^\circ$
- (iii) From B, set off 5.5cm
- (iv) Join CD
- (v) Draw the perpendicular bisector of CD, intersecting BD at A.
- (vi) Join AC

Then, $\triangle ABC$ is the required right triangle.

Verification,

On measuring , we find that

$$AC+BC = 5.5\text{cm}$$

ANSWER21

Given, in $\triangle ABC$ $\angle B = 45^\circ$ $\angle C = 60^\circ$ and the \perp from the vertex A to base BC is 4.5cm

- (i) Draw a line segment PQ
- (ii) From any point D on line PQ , we draw $DE \perp PQ$
- (iii) Cut off $DA = 4.5\text{cm}$ along DE.
- (iv) Through A draw $LM \parallel PQ$.
- (v) Construct $\angle LAB = 45^\circ$ and $\angle MAC = 60^\circ$,
Meeting PQ at B and C respectively.

Then, $\triangle ABC$ is required triangle.