

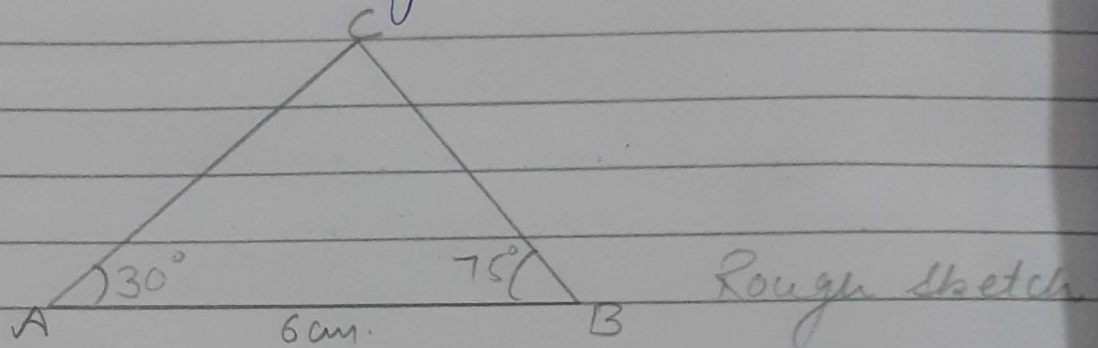
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Construction of a Triangle Using ASA criterion.

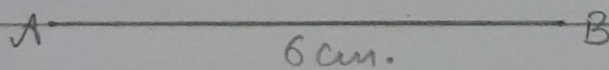
Exercise - 10.4

- ① Construct $\triangle ABC$, given $AB = 6\text{cm}$, $\angle A = 30^\circ$, and $\angle B = 75^\circ$

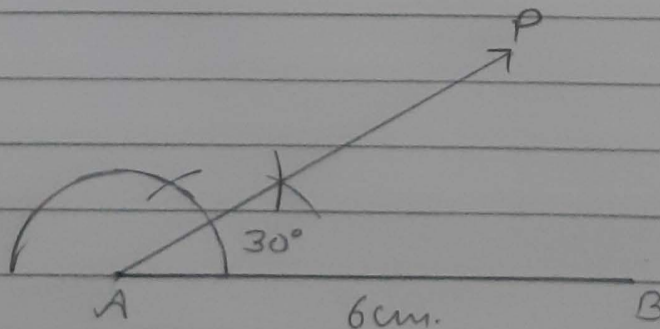
Solution: ① First we draw rough sketch of triangle ABC with given measures.



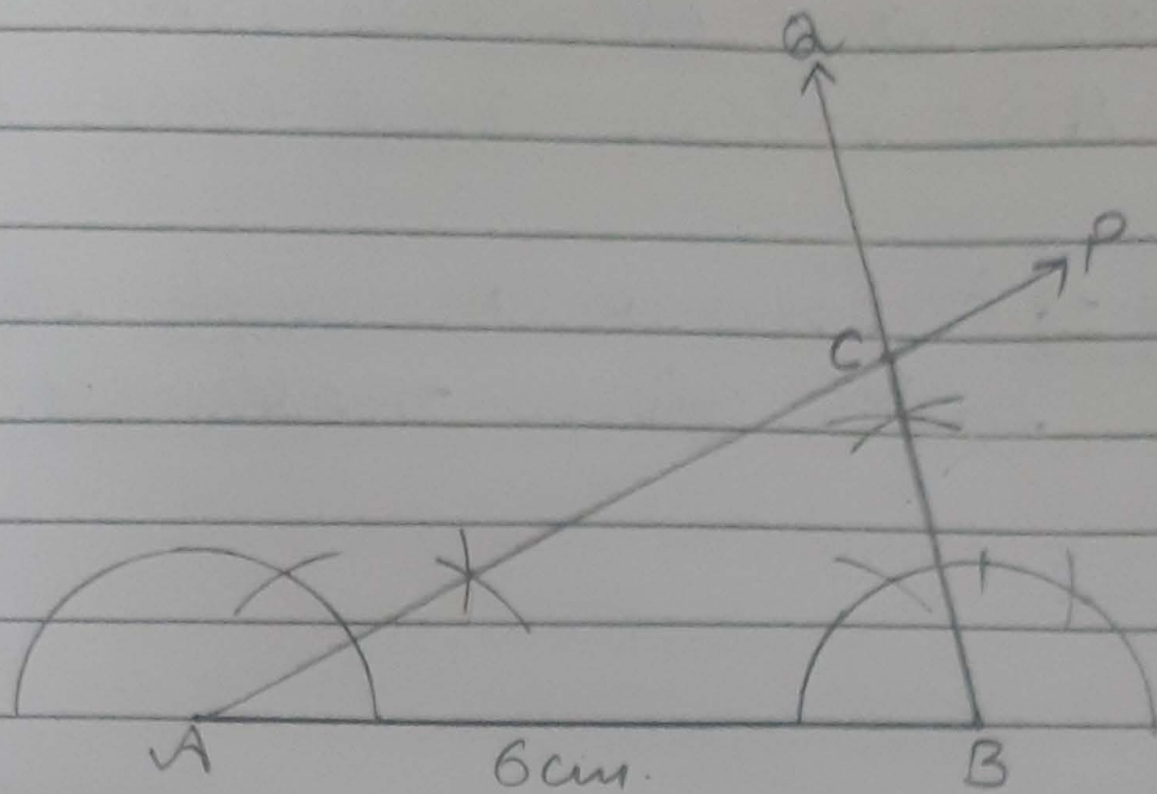
Step 2 :- Draw a line segment $AB = 6\text{cm}$.



Step 3 :- With the help of Compass, Draw a ray AP at A making an angle 30° with AB.



Step 4 :- Similarly, At B draw a ray BQ making an angle of 75° with AB.

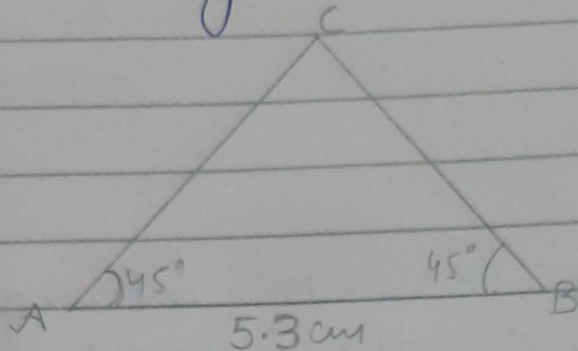


Step 5 $\div$ Rays AP and BQ intersect at a point say C , then $\triangle ABC$ is the required triangle.

②

Construct an isosceles $\triangle ABC$ such that base $AB = 5.3\text{cm}$ and each base angle $= 45^\circ$.

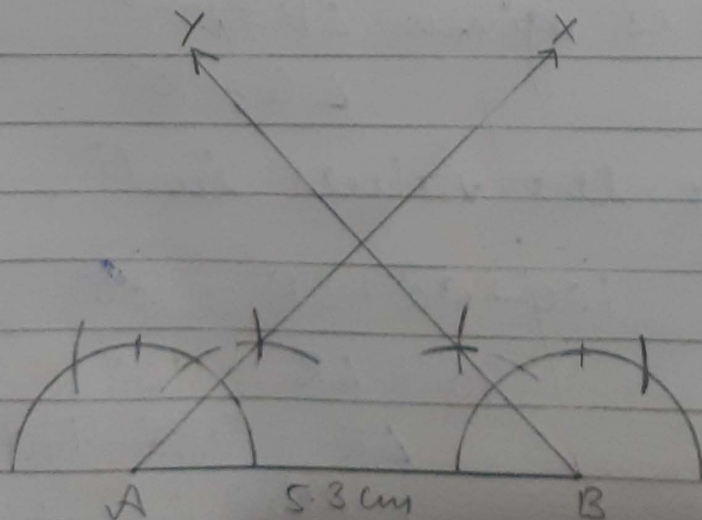
Solution Step 1 :- Draw a rough sketch of $\triangle ABC$ with given measures.



Step 2 :- Draw a line segment $AB = 5.3\text{cm}$.

Step 3 :- Taking A as centre with the help of Compass, Draw a ray AX making an angle 45° with AB.

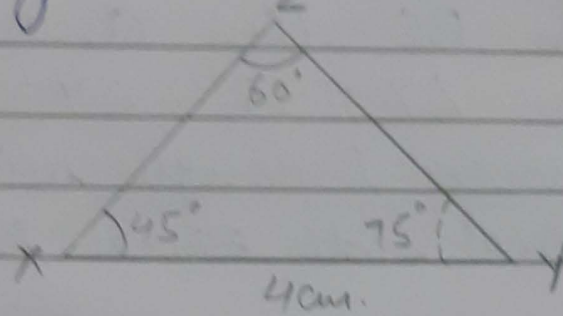
Step 4 :- With the help of Compass, taking B as a centre. Draw a ray BY making an angle of 45° with the line segment AB.



Step 5 :- Rays AX and BY intersect at a point C. Hence $\triangle ABC$ is the required triangle.

5) Construct ΔXYZ if $XY = 4\text{cm}$, $\angle X = 45^\circ$ and $\angle Z = 60^\circ$.

Solution:- Step 1:- Draw a rough sketch of ΔXYZ with given measures.



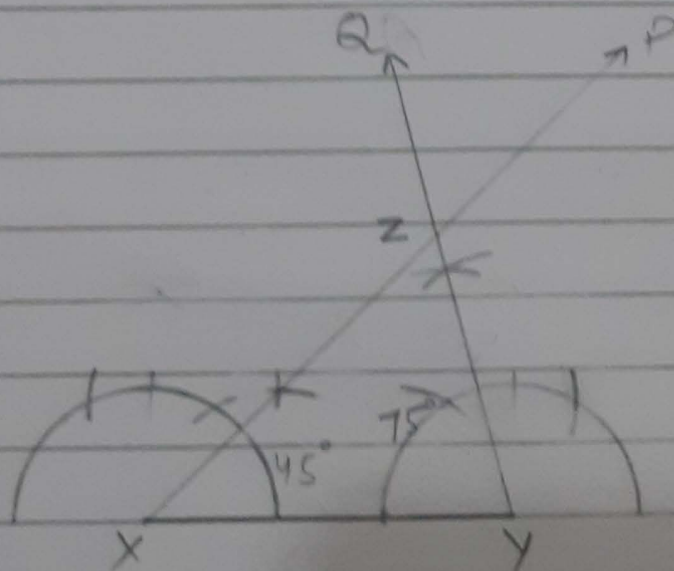
$$\angle Y = 180^\circ - 45^\circ - 60^\circ = 75^\circ$$

($\because$ Sum of all angles of a triangle is 180°)

Step 2:- Draw a line segment $= 4\text{cm}$.

Step 3:- Taking X as centre with the help of Compass, Draw a ray XP making an angle of 45° with AB.

Step 4:- With the help of Compass, taking Y as a centre, Draw a ray YQ making an angle of 75° with AB.



Step 5:- Rays XP and YQ intersect at a point Z. Hence ΔXYZ is the required triangle.

- ④ Examine whether you can construct $\triangle PQR$ such that $\angle P = 100^\circ$, $\angle Q = 90^\circ$ and $PQ = 4.3\text{cm}$. If not possible, give reason.

[Solution] : We know sum of all angles of a triangle is 180° .

So in $\triangle PQR$, $\angle P + \angle Q + \angle R = 180^\circ$ — (1)

It is given $\angle P = 100^\circ$
 $\angle Q = 90^\circ$

Putting the values in (1)

$$100^\circ + 90^\circ + \angle R = 180^\circ$$

$$190^\circ + \angle R = 180^\circ$$

$$\angle R = 180^\circ - 190^\circ = -10^\circ$$

which is not possible.

Hence, $\triangle PQR$ cannot be constructed.

⑤ (i) In which of the following cases a unique triangle can be drawn?

- a) $BC = 5\text{cm}$, $\angle B = 90^\circ$ and $\angle C = 100^\circ$
- b) $AB = 4\text{cm}$, $BC = 7\text{cm}$ and $CA = 2\text{cm}$
- ☒ c) $XY = 5\text{cm}$, $\angle X = 45^\circ$, $\angle Y = 60^\circ$
- d) An isosceles triangle with length of each equal side equal to 5cm .

(ii) A triangle can be constructed by taking two of its angles as.

- | | |
|--|--------------------------|
| ☒ a) $110^\circ, 40^\circ$ | b) $70^\circ, 115^\circ$ |
| c) $135^\circ, 45^\circ$ | d) $90^\circ, 90^\circ$ |