

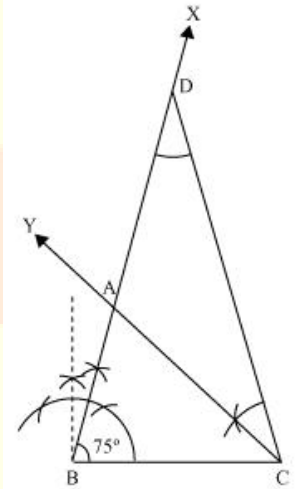
Exercise 11.2

Question 1.

Construct a triangle ABC in which $BC = 7$ cm, $\angle B = 75^\circ$ and $AB + AC = 13$ cm.

Solution:

- (i) Draw line segment BC of length 7 cm. At point B, draw an angle of 75° , $\angle XBC$.
- (ii) Mark a line segment $BD = 13$ cm ($AB + AC$) from the ray BX.
- (iii) Join DC and make $\angle DCY$ equal to $\angle BDC$.
- (iv) Let CY intersect BD at A. $\triangle ABC$ is the required triangle.



Justification

Point A lies on the perpendicular bisector of DC so, $AD = AC$
 Now, $AB = BD - AD$
 $AB = BD - AC$ [as $AD = AC$]
 $AB + AC = BD$

Question 2:

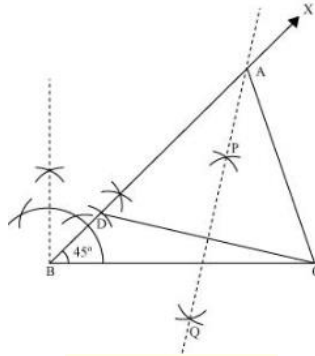
Construct a triangle ABC in which $BC = 8$ cm, $\angle B = 45^\circ$ and $AB - AC = 3.5$ cm.

Solution:

- (i) Draw line segment $BC = 8$ cm and at B, make an angle of 45° , $\angle XBC$.
- (ii) Mark the line segment $BD = 3.5$ cm (equal to $AB - AC$) on ray BX.
- (iii) Join DC and draw PQ, perpendicular bisector of DC.
- (iv) Let it intersect BX at point A. Join AC.

ABC is the required triangle.

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Construction**



Justification

Point A lies on the perpendicular bisector of DC so, $AD = AC$

Now, $BD = AB - AD$

$BD = AB - AC$ [using $AD = AC$]

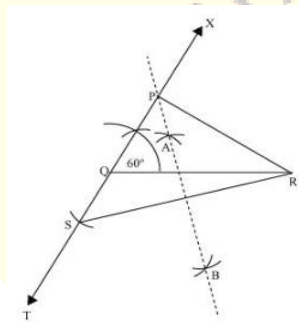
Question 3:

Construct a triangle PQR in which $QR = 6$ cm, $\angle Q = 60^\circ$ and $PR - PQ = 2$ cm

Solution:

- (i) Draw line segment $QR = 6$ cm. At Q, draw an angle of 60° , $\angle XQR$.
- (ii) Mark a line segment QS of 2 cm from line segment QT extended in the opposite side of line segment XQ. Join SR.
- (iii) Draw AB, perpendicular bisector of SR. Let it intersect QX at point P.
- (iv) Join PQ and PR.

ΔPQR is the required triangle.



Justification

Point P lies on the perpendicular bisector of SR so, $PS = PR$

Now, $QS = PS - PQ$

$QS = PR - PQ$ [PS = PR]

Question 4:

Construct a triangle XYZ in which $\angle Y = 30^\circ$, $\angle Z = 90^\circ$ and $XY + YZ + ZX = 11$ cm.

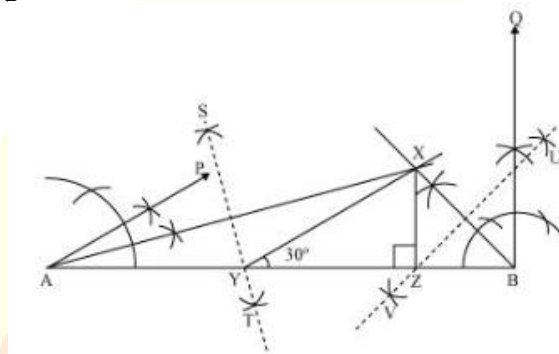
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Solution:

The below given steps will be followed to construct the required triangle.

- (i) Draw line segment $AB = 11$ cm. ($XY + YZ + ZX = 11$ cm)
- (ii) Construct $\angle PAB$, of 30° at A and $\angle QBA$, of 90° at B.
- (iii) Bisect $\angle PAB$ and $\angle QBA$. Let these bisectors intersect each other at X.
- (iv) Draw perpendicular bisector ST and UV of BX and AX respectively.
- (v) Let ST intersect AB at Y and UV intersect AB at Z.
- (vi) Join XY, XZ.

$\triangle XYZ$ is the required triangle



Justification

Point Y lies on the perpendicular bisector of AX so, $AY = XY$

Point Z lies on the perpendicular bisector of BX so, $BZ = ZX$

Now, $AB = AY + YZ + ZB$

$AB = XY + YZ + ZX$ [$AY = XY$ and $BZ = ZX$]

$\angle XYZ$ is the exterior angle of triangle AXY .

Therefore, $\angle XYZ = \angle YXA + \angle YAZ = 15^\circ + 15^\circ = 30^\circ$

Similarly, $\angle XYZ$ is the exterior angle of triangle BXY .

Hence, $\angle XYZ = \angle ZXB + \angle ZBX$

$$= 45^\circ + 45^\circ$$

$$= 90^\circ$$

Question 5:

Construct a right triangle whose base is 12 cm and sum of its hypotenuse and other side is 18 cm.

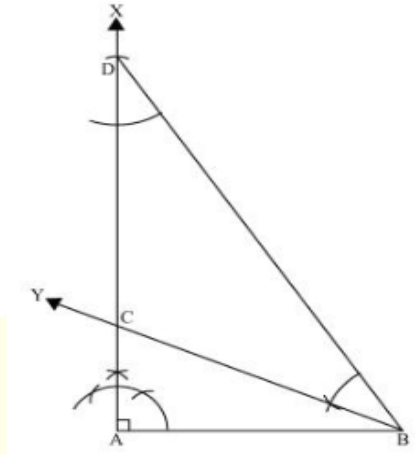
Solution:

- (i) Draw line segment $AB = 12$ cm. Draw a AX making 90° with AB .
- (ii) Mark line segment AD of 18 cm (as the sum of the other two sides is 18) from ray AX .
- (iii) Join DB and make $\angle DBY$ equal to $\angle ADB$.

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- (iv) Let BY intersect AX at C .
- (v) Join AC , BC .

$\triangle ABC$ is the required triangle



Justification

Point C lies on the perpendicular bisector of BD

So, $BC = CD$

Now, $AD = AC - CD$

$AD = AC - BC$

[using $BC = CD$]