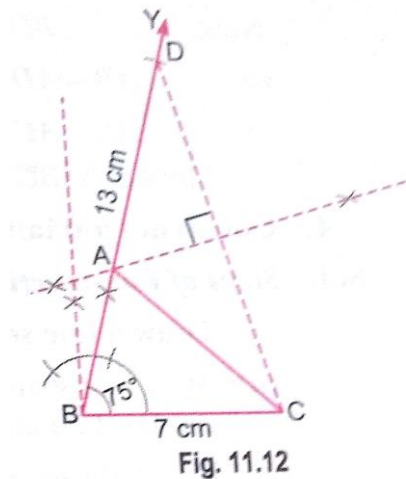


Long Answer Type Questions

[4 Marks]

Que 1. Construct a triangle ABC in which $BC = 7$ cm, $\angle B = 75^\circ$ and $AB + AC = 13$ cm.

Sol. Steps of Construction



- (i) Draw $BC = 7$ cm.
- (ii) Construct $\angle YBC = 75^\circ$.
- (iii) From ray BY, cut-off line segment $BD = AB + AC = 13$ cm.
- (iv) Join CD.
- (v) Draw the perpendicular bisector of CD meeting BY at A.
- (vi) Join AC to obtain the required triangle ABC.

Justification

Since A lies on the perpendicular bisector of CD.

$$\therefore AC = AD$$

$$\text{Now } BD = 13 \text{ cm}$$

$$\Rightarrow BA + AD = 13 \text{ cm}$$

$$\Rightarrow BA + AC = 13 \text{ cm}$$

Hence, $\triangle ABC$ is the required triangle.

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

Sol. Steps of Construction

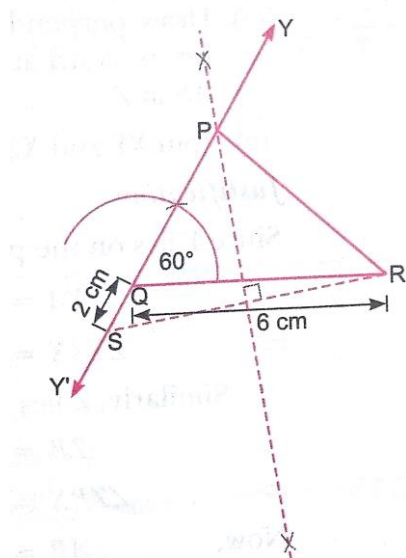


Fig. 11.13

- (i) Draw $QR = 6$ cm.
- (ii) Construct $\angle YQR = 60^\circ$.
- (iii) Produce YQ to Y' to form line YQY' .
- (iv) From ray QY' , cut-off line segment $QS = 2$ cm.
- (v) Join SR .
- (vi) Draw perpendicular bisector of RS which intersect QY at P .
- (vii) Join PR to obtain required ΔPQR .

Justification

As P lies on the perpendicular bisector of RS .
Therefore, $PR = PS = PQ + QS = PQ + 2$ cm
 $\Rightarrow PR - PQ = 2$ cm
Hence, ΔPQR is the required triangle.

Que 3. Construct a triangle ABC in which $BC = 8\text{ cm}$, $\angle B = 45^\circ$ and $AB - AC = 3.5\text{ cm}$.

Sol. Steps of Construction

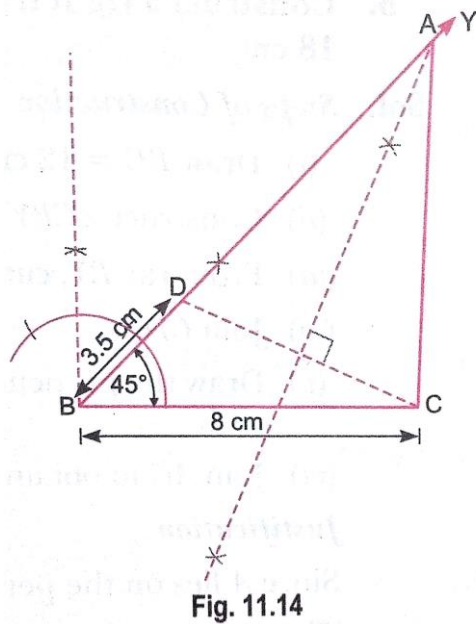


Fig. 11.14

- (i) Draw $BC = 8\text{ cm}$.
- (ii) Construct $\angle YBC = 45^\circ$
- (iii) From ray BY , cut-off line segment $BD = 3.5\text{ cm}$.
- (iv) Join CD .
- (v) Draw perpendicular bisector of CD intersecting BY at A .
- (vi) Join AC to obtain the required triangle ABC .

Justification

As A lies on the perpendicular bisector of CD . Therefore,

$$AD = AC$$

Now, $BD = 3.5\text{ cm}$

$$\Rightarrow AB - AD = 3.5\text{ cm}$$

$$\Rightarrow AB - AC = 3.5\text{ cm}$$

Hence, $\triangle ABC$ is the required triangle.

Que 4. Construct a triangle XYZ in which $\angle Y = 30^\circ$, $\angle Z = 90^\circ$ and $XY + YZ + ZX = 11$ cm.

Sol. Steps of Construction

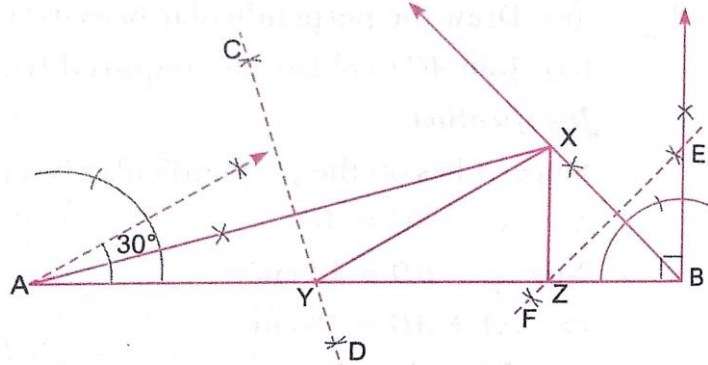


Fig. 11.15

- (i) Draw a line segment $AB = 11$ cm.
- (ii) At A, construct an angle of 30° and B construct an angle of 90° .
- (iii) Bisect these angles. Let bisector of these angles intersect at point X.
- (iv) Draw perpendicular bisector CD of XA to intersect AB at Y and EF of XB to intersect AB at Z.
- (v) Join XY and XZ to obtain required $\triangle XYZ$.

Justification

Since Y lies on the perpendicular bisector of XB. Therefore,

$$YB = YX$$

$$\Rightarrow \angle YBX = \angle YXB$$

$$\text{Now, } AB = AY + YZ + ZB \quad \Rightarrow \quad AB = XY + YZ + ZX$$

In $\triangle XAY$, we have

$$\angle XYZ = \angle YXA + \angle YAX = 2 \angle YAX = \angle A$$

In $\triangle XBY$, we have

$$\angle XZY = \angle ZBX + \angle ZXB = 2 \angle ZBX = \angle B$$

Que 5. Construct a right triangle whose base is 12 cm and sum of its hypotenuse and other side is 18 cm.

Sol. Steps of Construction

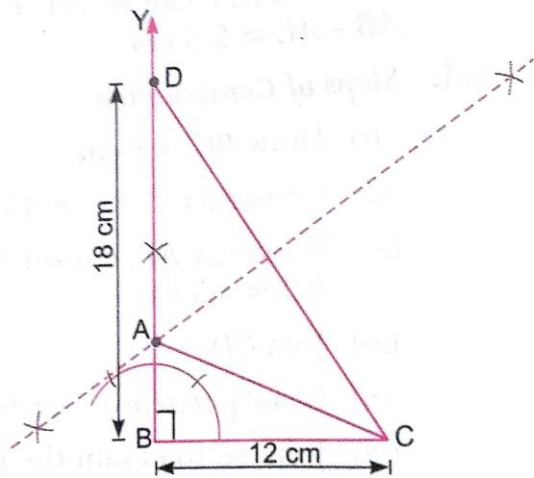


Fig. 11.16

- (i) Draw $BC = 12$ cm.
- (ii) Construct $\angle CBY = 90^\circ$
- (iii) From ray BY , cut-off line segment $BD = 10$ cm.
- (iv) Join CD .
- (v) Draw AC to obtain the required $\triangle ABC$.

Justification

Since A lies on the perpendicular bisector of CD .
Therefore,

$$AD = AC$$

Now, $BD = BA + AD$

$\Rightarrow BD = AB + AC$

Hence, $\triangle ABC$ is the required triangle.