Exercise 17.1

1. Construct a ΔABC, in which:

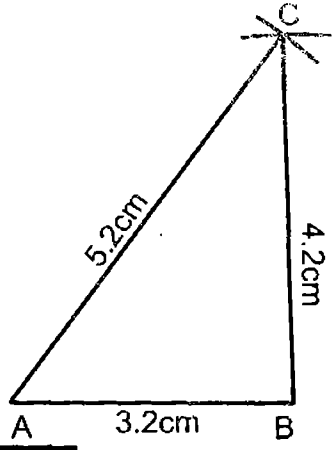
(i) $m\overline{AB} = 3.2cm$, $m\overline{BC} = 4.2cm$, $m\overline{CA} = 5.2cm$

Given

The sides $m\overline{AB} = 3.2cm$, $m\overline{BC} = 4.2cm$, $m\overline{CA} = 5.2cm$ of ΔABC

Required

To construct the ΔABC



Construction

(i) Draw a line segment $m\overline{AB} = 3.2cm$

(ii) With centre B and radius 4.2cm, draw an arc.

(iii) With centre A and radius 5.2cm, draw another arc which meet previous arc at point C.

(iv) Join C to B and A.

Then ABC is the required Δ.

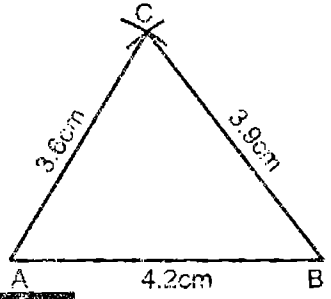
(ii) $m\overline{AB} = 4.2cm$, $m\overline{BC} = 3.9cm$, $m\overline{CA} = 3.6cm$

Given

The sides $m\overline{AB} = 4.2cm$, $m\overline{BC} = 3.9cm$, $m\overline{CA} = 3.6cm$ of ΔABC

Required

To construct the ΔABC



Construction

(i) Draw a line segment $m\overline{AB} = 4.2cm$

(ii) With centre B and radius 3.9cm, draw an arc.

(iii) With centre A and radius 3.6cm, draw another arc which meet previous arc at point C.

(iv) Join A to C and B to C.

Then ABC is the required Δ.

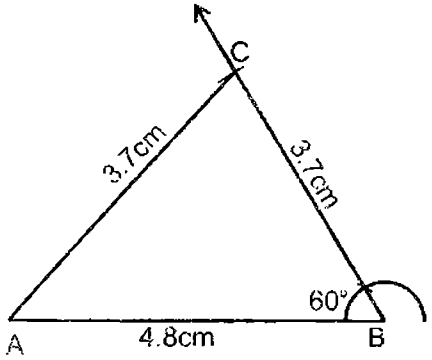
(iii) $m\overline{AB} = 4.8cm$, $m\overline{BC} = 3.7cm$, $m\angle B = 60^\circ$

Given

The sides $m\overline{AB} = 4.8cm$, $m\overline{BC} = 3.7cm$ and $m\angle B = 60^\circ$ of ΔABC

Required

To construct the ΔABC



Construction

(i) Draw a line segment $m\overline{AB} = 4.8cm$

(ii) At the end point B of $\overline{AB}$ make $m\angle B = 60^\circ$.

(iii) Cut off $m\overline{BC} = 3.7cm$ from the terminal side of $\angle 60^\circ$.

(iv) Join AC

Then ABC is the required Δ.

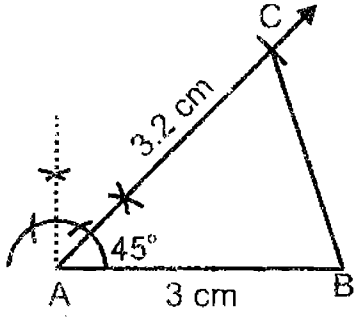
(iv) $m\overline{AB} = 3cm$, $m\overline{AC} = 3.2cm$, $m\angle A = 45^\circ$.

Given

The sides $m\overline{AB} = 3cm$, $m\overline{AC} = 3.2cm$ and $m\angle A = 45^\circ$ of ΔABC

Required

To construct the ΔABC



Construction

(i) Draw a line segment $m\overline{AB} = 3cm$.

(ii) At the end point A of $\overline{AB}$ make $m\angle A = 45^\circ$.

(ii) Cut off $m\overline{AC} = 3.2cm$ from the terminal side of $\angle 45^\circ$.

(iv) Join BC

Then ABC is the required Δ.

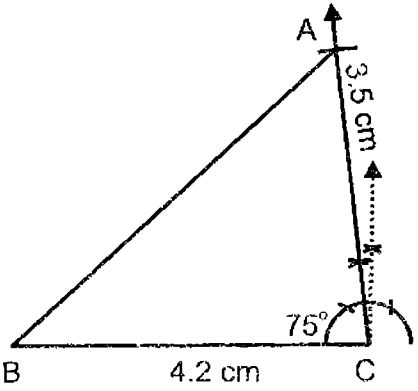
(v) $m\overline{BC} = 4.2cm$, $m\overline{CA} = 3.5cm$, $m\angle C = 75^\circ$

Given

The sides $m\overline{BC} = 4.2cm$, $m\overline{CA} = 3.5cm$ and $m\angle C = 75^\circ$ of ΔABC

Required

To construct the ΔABC



Construction

(i) Draw a line segment $m\overline{BC} = 4.2cm$.

(ii) At the end point C of $\overline{BC}$ make $m\angle C = 75^\circ$.

(iii) Cut off $m\overline{AC} = 3.5cm$ from the terminal side of $\angle 75^\circ$.

(iv) Join AB.

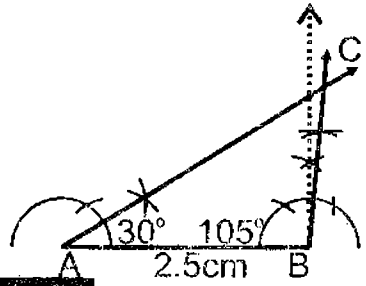
Then ABC is the required Δ.

(vi) $m\overline{AB} = 2.5cm$, $m\angle A = 30^\circ$, $m\angle B = 105^\circ$.

The side $m\overline{AB} = 2.5cm$ and angles $m\angle A = 30^\circ, m\angle B = 105^\circ$ of ΔABC

Required

To construct the ΔABC



Construction

(i) Draw the line segment $m\overline{AB} = 2.5cm$.

(ii) At the end point A of $\overline{AB}$ make $\angle A = 30^\circ$.

(iii) At the end point B of $\overline{AB}$ make $m\angle B = 105^\circ$.

(iv) The terminal sides of these two angles meet in C.

Then ABC is required Δ.

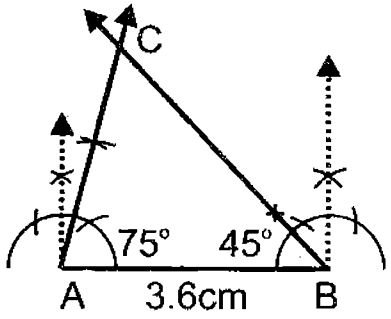
(vii) $m\overline{AB} = 3.6cm, m\angle A = 75^\circ$, $m\angle B = 45^\circ$.

Given

The side $m\overline{AB} = 3.6cm$ and angles $m\angle A = 75^\circ$, $m\angle B = 45^\circ$ of ΔABC

Required

To construct the ΔABC



(i) Draw the line segment $m\overline{AB} = 3.6cm$.

(ii) At the end point A of $\overline{AB}$ make $m\angle A = 75^\circ$.

(iii) At the end point B of $\overline{AB}$ make $m\angle B = 45^\circ$.

(iv) The terminal sides of these two angles meet at C.

Then ABC is the required Δ.

Q.2. Construct a Δ xyz in which

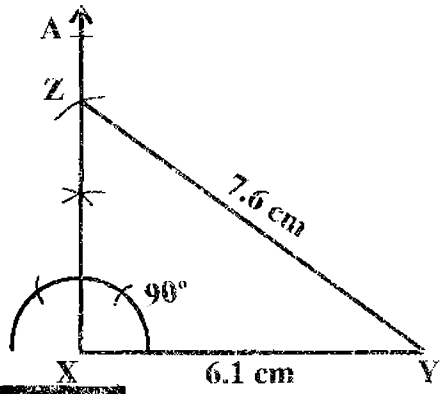
(i) $m\overline{YZ} = 7.6cm, m\overline{XY} = 6.1cm$, $m\angle X = 90^\circ$.

Given

The sides $m\overline{YZ} = 7.6cm, m\overline{XY} = 6.1cm$ and $m\angle X = 90^\circ$ **of ΔXYZ.**

Required

To construct the ΔXYZ



Construction

(i) Draw the line segment $m\overline{XY} = 6.1cm$

(ii) At the end point X of $\overline{XY}$ make $m\angle X = 90^\circ$.

(iii) With Y as centre and radius 7.6cm, draw an arc which cut terminal side of $\angle 90^\circ$ at point Z.

(iv) Join ZY.

Then XYZ is the required Δ.

(ii) **$m\overline{ZX}$=6.4cm, $m\overline{YZ}$ = 2.4cm, $m\angle Y = 90^\circ$**

Given

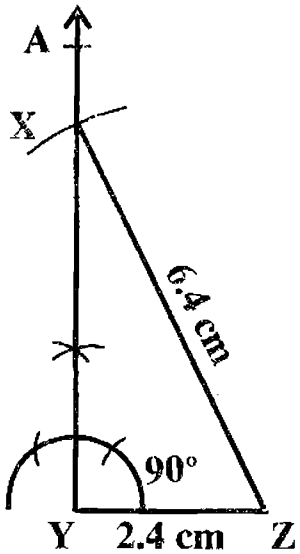
The sides

$m\overline{ZX} = 6.4cm, m\overline{YZ} = 2.4cm$ and

$m\angle Y = 90^\circ$ of **ΔXYZ.**

Required

To construct the ΔXYZ



Construction

(i) Draw the line segment $m\overline{YZ} = 2.4cm$

(ii) At the end point Y of $\overline{YZ}$ make $m\angle Y = 90^\circ$.

(iii) With Z as centre and radius 6.4cm draw an arc which cut terminal side of $\angle 90^\circ$ at point X.

(iv) Join XZ.

Then XYZ is the required Δ.

(iii) $m\overline{XY}$ = 5.5cm, $m\overline{ZX}$ = 4.5cm, $m\angle Z = 90^\circ$

Given

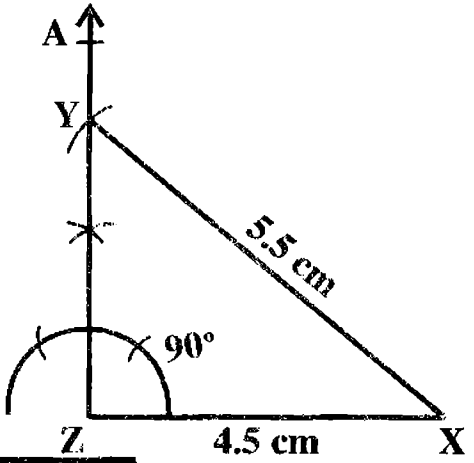
The sides

$m\overline{XY} = 5.5cm, m\overline{ZX} = 4.5cm$ and

$m\angle Z = 90^\circ$ of ΔXYZ.

Required

To construct the ΔXYZ



Construction

(i) Draw a line segment $m\overline{ZX} = 4.5cm$

(ii) At the end point Z of $\overline{ZX}$ make $m\angle Z = 90^\circ$.

(iii) With X as centre and radius 5.5cm draw an arc which cut terminal side of $\angle 90^\circ$ at point Y

(iv) Join XY.

Then XYZ is the required Δ.

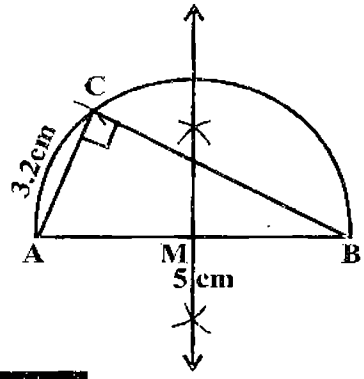
Q.3. Construct a right angled Δ measure of whose hypotenuse is 5cm and one side is 3.2cm.

Given

In right angled Δ hypotenuse is 5cm and one side is 3.2cm

Required

To construct the ΔXYZ



Construction

(i) Draw a line segment $m\overline{AB} = 5cm$.

(ii) With $\overline{AB}$ as diameter, draw a semi circle.

(iii) With A as center draw an arc of radius 3.2cm cutting the semi circle in C.

(iv) Join C with A and B.

Therefore ABC is required triangle with $\angle C = 90^\circ$

Q.4 Construct a right angled isosceles triangle. Whose hypotenuse is:

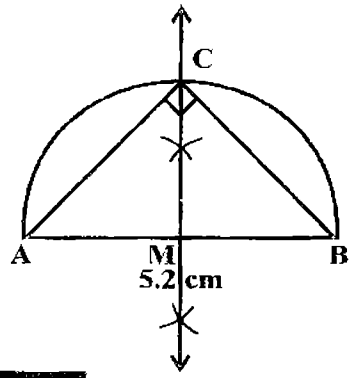
i) Hypotenuse 5.2cm long

Given

In right angled isosceles triangle hypotenuse is 5.2 cm.

Required

To construct right angled isosceles triangle



Construction

(i) Take $m\overline{AB} = 5.2cm$.

(ii) Find mid-point M of $\overline{AB}$.

(iii) With centre as M and radius $m\overline{AM} = m\overline{MB}$ draw a semi circle which intersects the bisector in C.

(iv) Join A to C and B to C.

Then ΔABC is the required right angled isosceles triangle with $\angle C = 90^\circ$

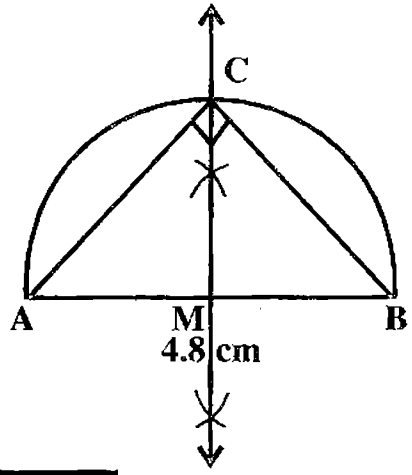
(ii) Hypotenuse 4.8 cm

Given

In right angled isosceles triangle hypotenuse is 4.8 cm.

Required

To construct right angled isosceles triangle.



Construction

(i) Take $m\overline{AB} = 4.8cm$.

(ii) Find mid-point M of $\overline{AB}$.

(iii) With centre as M and radius $m\overline{AM} = m\overline{MB}$ draw a semi circle which intersects the bisector in C.

(iv) Join A to C and B to C.

Then ΔABC is the required right angled isosceles triangle with $\angle C = 90^\circ$

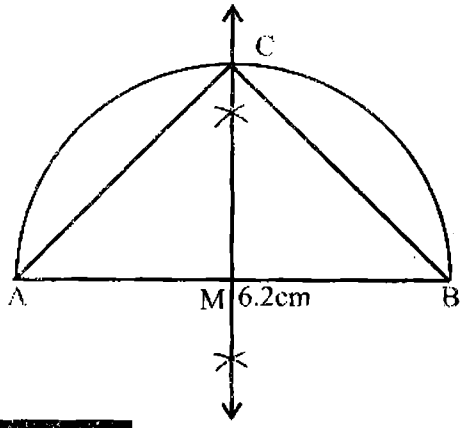
(iii) Hypotenuse 6.2 cm

Given

In right angled isosceles triangle hypotenuse is 6.2 cm.

Required

To construct right angled isosceles triangle.



Construction

(i) Take $m\overline{AB} = 6.2cm$.

(ii) Find mid-point M of AB.

(iii) With centre as M and radius $m\overline{AM} = m\overline{MB}$ draw a semi circle which intersects the bisector in C.

(iv) Join A to C and B to C.

Then ΔABC is the required right angled isosceles triangle with $\angle C = 90^\circ$

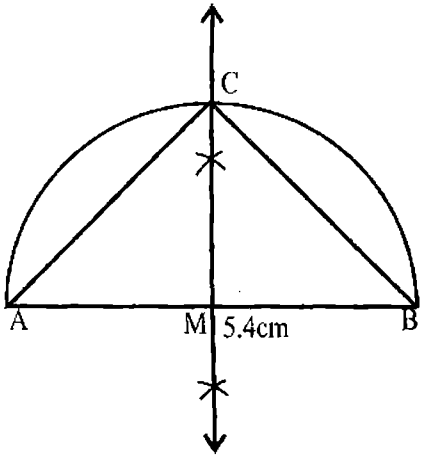
(iv) Hypotenuse 5.4 cm

Given

In right angled isosceles triangle hypotenuse is 5.4 cm.

Required

To construct right angled isosceles triangle.



Construction

(i) Take $m\overline{AB} = 5.4cm$.

(ii) Find mid-point M of AB.

(iii) With centre as M and radius $m\overline{AM} = m\overline{MB}$ draw a semi circle which intersects the bisector in C.

(iv) Join A to C and B to C.

Then ΔABC is the required right angled isosceles triangle with $\angle C = 90^\circ$

Q.5. (Ambiguous case) construct a ΔABC in which

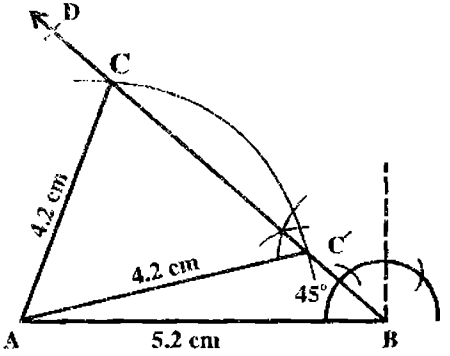
(i) $m\overline{AC} = 4.2cm, m\overline{AB} = 5.2cm$, $m\angle B = 45^\circ$.

Given

In ΔABC $m\overline{AC} = 4.2cm, m\overline{AB} = 5.2cm$, $m\angle B = 45^\circ$.

Required

To construct ΔABC



Construction

(i) Draw a line segment $m\overline{AB} = 5.2cm$.

(ii) At the end point B of $\overline{BA}$ make $m\angle B = 45^\circ$.

(iii) With centre A and radius 4.2cm draw an arc which cuts $\overline{BD}$ in two distinct points C and C′.

(iv) Join AC and AC′.

$\therefore$ ΔABC and $\Delta ABC'$ are required triangles.

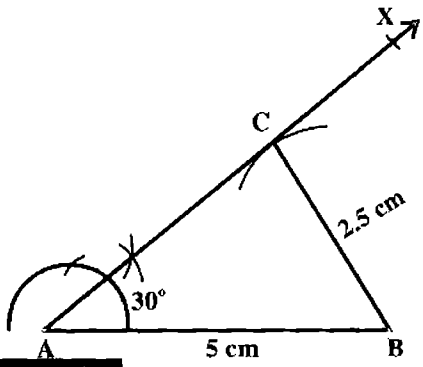
(ii) $m\overline{BC} = 2.5cm$, $m\overline{AB} = 5.0cm$, $m\angle A = 30^{\circ}$.

Given

In ΔABC $m\overline{BC} = 2.5cm$, $m\overline{AB} = 5.0cm$, $m\angle A = 30^{\circ}$.

Required

To construct ΔABC



Construction

(i) Take $m\overline{AB} = 5cm$.

(ii) At the end point A of $\overline{AB}$ make $m\angle A = 30^{\circ}$.

(iii) With centre B and radius 2.5cm draw an arc which touches $\overrightarrow{AX}$ at point C.

(iv) Join BC.

$\therefore$ ΔABC is required triangle.