Construction of Triangle (English Medium)

Exercise

Solution 1:

Steps for construction:

(1) Draw $\overline{YZ}$ of length 5 cm.

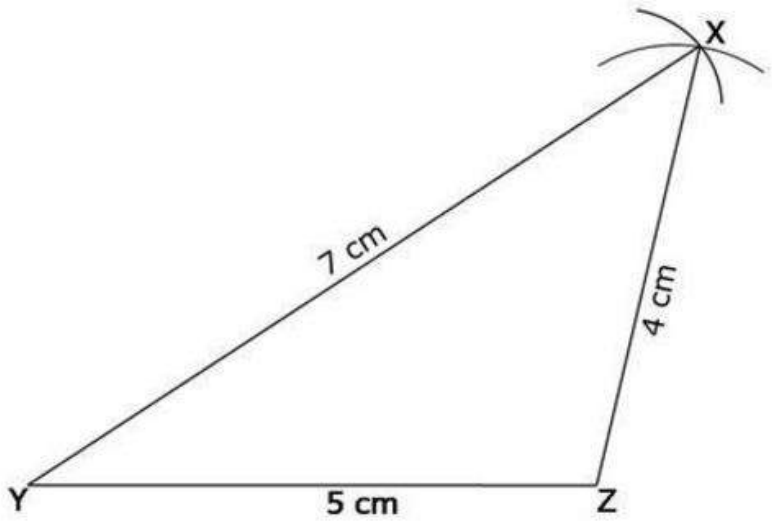
(2) Place the compass needle on point Y and draw an arc of radius 7 cm.

(3) Place the compass needle on point Z and draw an arc of radius 4 cm, intersecting the previous arc.

(4) Name the point of intersection as X.

(5) Join $\overline{XY}$ and $\overline{XZ}$.

ΔXYZ is the required triangle.



Solution 2:

Steps for construction:

(1) Draw $\overline{EF}$ of length 5.5 cm.

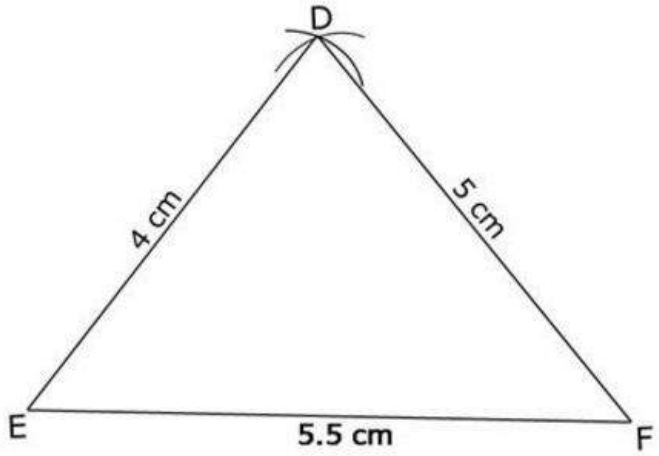
(2) Place the compass needle on point E and draw an arc of radius 4 cm.

(3) Place the compass needle on point F and draw an arc of radius 5 cm, intersecting the previous arc.

(4) Name the point of intersection as D.

(5) Join $\overline{DE}$ and $\overline{DF}$.

ΔDEF is the required triangle.



Solution 3:

Steps for construction:

(1) Draw $\overline{QR}$ of length 5 cm.

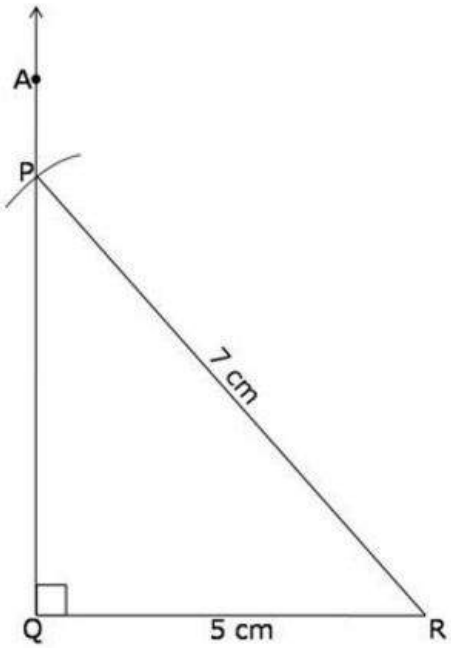
(2) Draw $\overline{QA}$ using a set-square.

(3) Place the compass needle on point R and draw an arc of radius 7 cm, intersecting $\overline{QA}$.

(4) Name the point of intersection as P.

(5) Join $\overline{PR}$.

ΔPQR is the required triangle.



Solution 4:

Steps for construction:

(1) Draw $\overline{XZ}$ of length 3 cm.

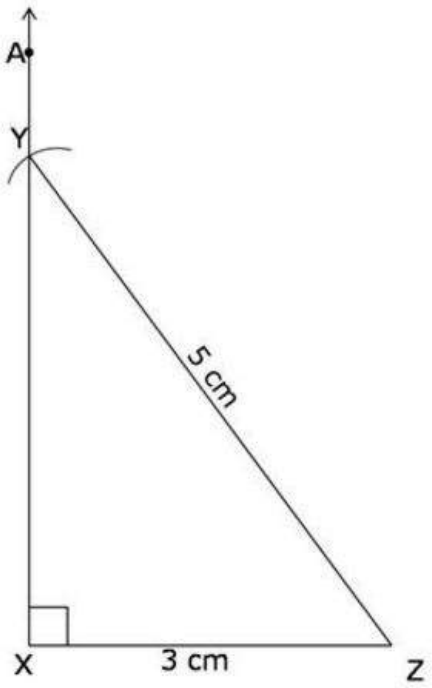
(2) Draw $\overline{XA}$ using a set-square.

(3) Place the compass needle on point Z and draw an arc of radius 5 cm, intersecting $\overline{XA}$.

(4) Name the point of intersection as Y.

(5) Join $\overline{YZ}$.

ΔXYZ is the required triangle.



Solution 5:

Steps for construction:

(1) Draw $\overline{BC}$ of length 5 cm.

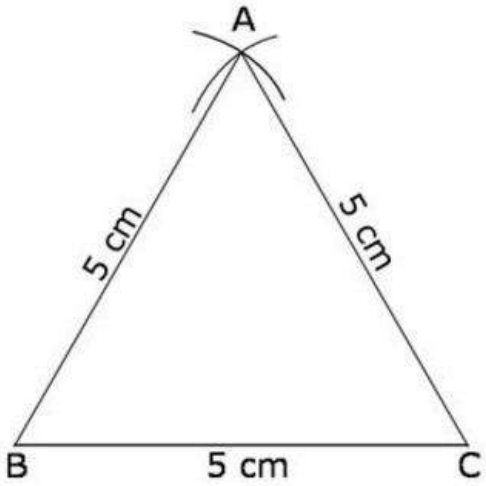
(2) Place the compass needle on point B and draw an arc of radius 5 cm.

(3) Place the compass needle on point C and draw an arc of radius 5 cm, intersecting the previous arc.

(4) Name the point of intersection as A.

(5) Join $\overline{AB}$ and $\overline{AC}$.

ΔABC is the required triangle.



Solution 6:

Steps for construction:

(1) Draw $\overline{YZ}$ of length 7 cm.

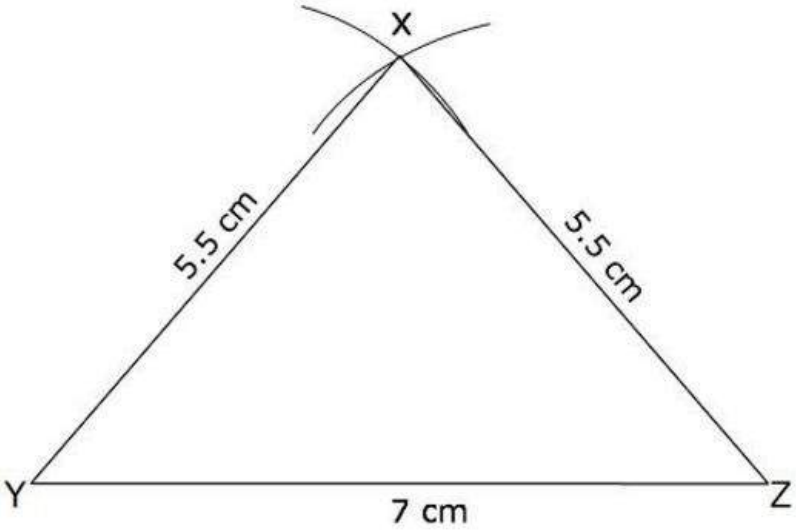
(2) Place the compass needle on point Y and draw an arc of radius 5.5 cm.

(3) Place the compass needle on point Z and draw an arc of radius 5.5 cm, intersecting the previous arc.

(4) Name the point of intersection as X.

(5) Join $\overline{XY}$ and $\overline{XZ}$.

ΔXYZ is the required triangle.



Solution 7:

Steps for construction:

(1) Draw $\overline{QR}$ of length 12 cm.

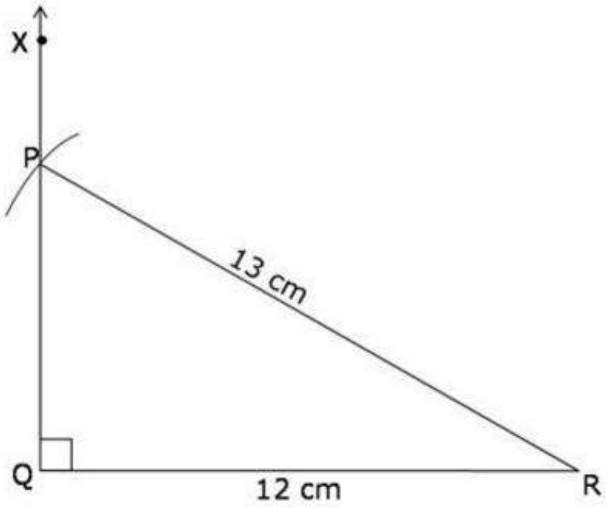
(2) Draw $\overline{QX}$ using a set-square such that $\angle XQR = 90°$.

(3) Place the compass needle on point R and draw an arc of radius 13 cm, intersecting $\overline{QX}$.

(4) Name the point of intersection as P.

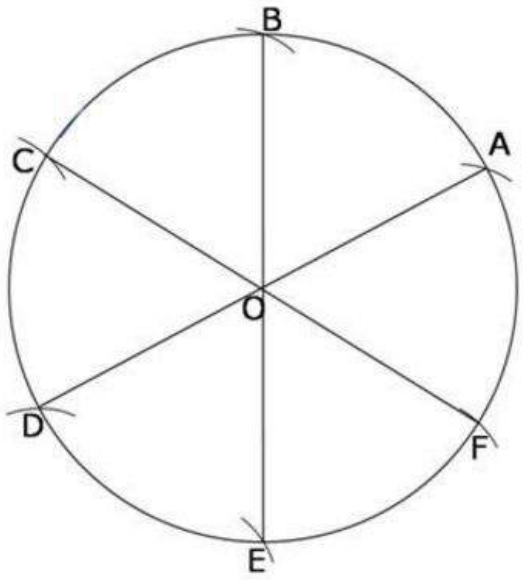
(5) Join $\overline{PQ}$.

ΔPQR is the required triangle.



Activity

Solution 1:



$m\angle AOB = 60°$

$m\angle BOC = 60°$

$m\angle COD = 60°$

$m\angle DOE = 60°$

$m\angle EOF = 60°$

$m\angle FOA = 60°$

Solution 2:

Steps for construction:

(1) Draw $\overline{BC}$ of length 4 cm.

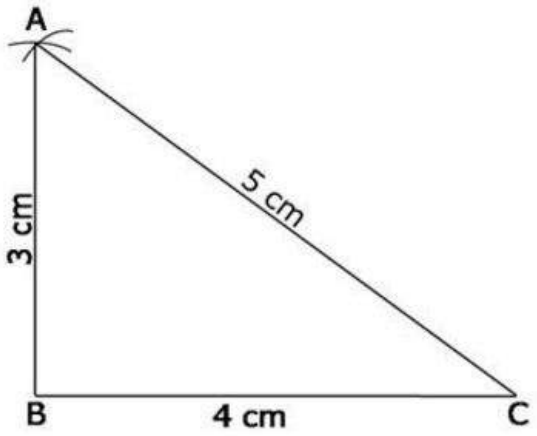
(2) Place the compass needle on point C and draw an arc of radius 5 cm.

(3) Place the compass needle on point B and draw an arc of radius 3 cm, intersecting the previous arc.

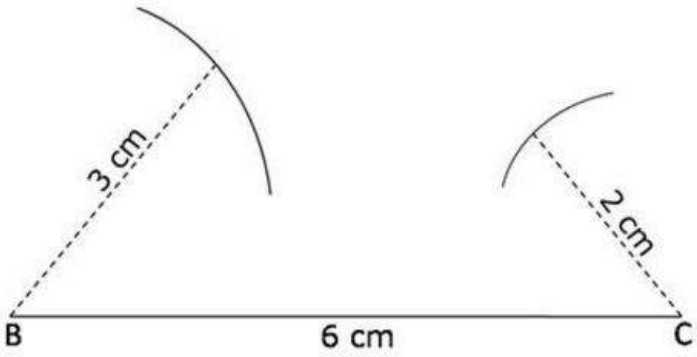
(4)Name the point of intersection as A.

(5) Join $\overline{AB}$ and $\overline{AC}$.

ΔABC is the required triangle.



Solution 3:



The triangle cannot be constructed as the length of BC is greater than the sum of the lengths of AB and AC.

Rule: The sum of measures of any two sides of a triangle is always greater than the measure of its third side.

Solution 4:

Sr. No.	Measure of one side of triangle	Measure of second side of triangle	Measure of third side of triangle	Is Δ constructed? Yes/No	Reason
(1)	4 cm	3 cm	8 cm	No	4 + 3 = 7 < 8
(2)	5.5 cm	4 cm	6 cm	Yes	5.5 + 4 = 9.5 > 6
(3)	3.5 cm	2 cm	4 cm	Yes	3.5 + 2 = 5.5 > 4
(4)	6 cm	8 cm	6.5 cm	Yes	6 + 8 = 14 > 6.5

Now, construct triangles for (2), (3) and (4) as we did in Activity 1 and 2.

Practice – 1

Solution 1:

Steps for construction:

(1) Draw $\overline{BC}$ of length 4 cm.

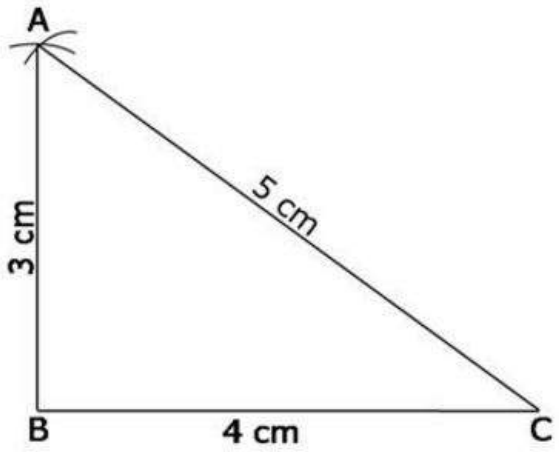
(2) Place the compass needle on point C and draw an arc of radius 5 cm.

(3) Place the compass needle on point B and draw an arc of radius 3 cm, intersecting the previous arc.

(4) Name the point of intersection as A.

(5) Join $\overline{AB}$ and $\overline{AC}$.

ΔABC is the required triangle.



Solution 2:

Steps for construction:

(1) Draw $\overline{YZ}$ of length 6 cm.

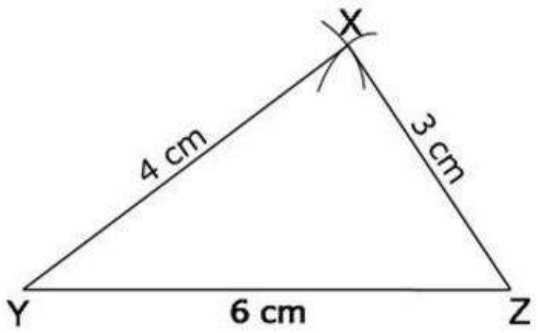
(2) Place the compass needle on point Y and draw an arc of radius 4 cm.

(3) Place the compass needle on point Z and draw an arc of radius 3 cm, intersecting the previous arc.

(4) Name the point of intersection as X.

(5) Join $\overline{XY}$ and $\overline{XZ}$.

ΔXYZ is the required traingle.



Solution 3:

Steps for construction:

(1) Draw $\overline{QR}$ of length 7 cm.

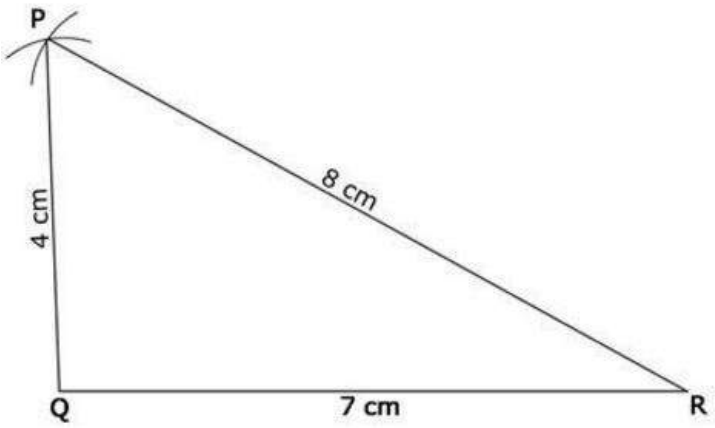
(2) Place the compass needle on point Q and draw an arc of radius 4 cm.

(3) Place the compass needle on point R and draw an arc of radius 8 cm, intersecting the previous arc.

(4) Name the point of intersection as P.

(5) Join $\overline{PQ}$ and $\overline{PR}$.

ΔPQR is the required triangle.



Solution 4:

Steps for construction:

(1) Draw $\overline{EF}$ of length 4.5 cm.

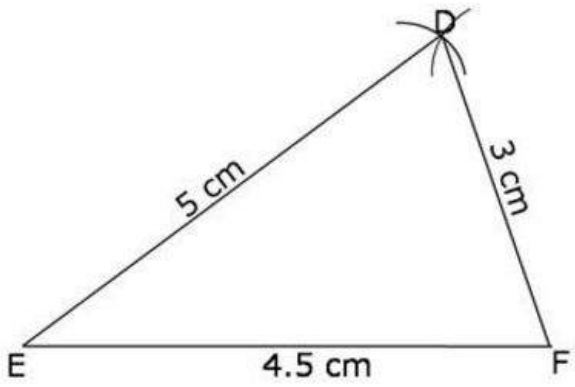
(2) Place the compass needle on point E and draw an arc of radius 5 cm.

(3) Place the compass needle on point F and draw an arc of radius 3 cm, intersecting the previous arc.

(4) Name the point of intersection as D.

(5) Join $\overline{DE}$ and $\overline{DF}$.

ΔDEF is the required triangle.



Solution 5:

Steps for construction:

(1) Draw $\overline{VW}$ of length 6 cm.

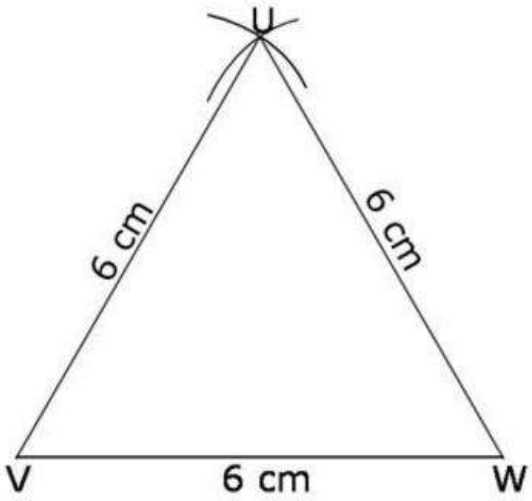
(2) Place the compass needle on point V and draw an arc of radius 6 cm.

(3) Place the compass needle on point W and draw an arc of radius 6 cm, intersecting the previous arc.

(4) Name the point of intersection as U.

(5) Join $\overline{UV}$ and $\overline{UW}$.

ΔUVW is the required triangle.



Practice – 2

Solution 1:

Steps for construction:

(1) Draw $\overline{AB}$ of length 6 cm.

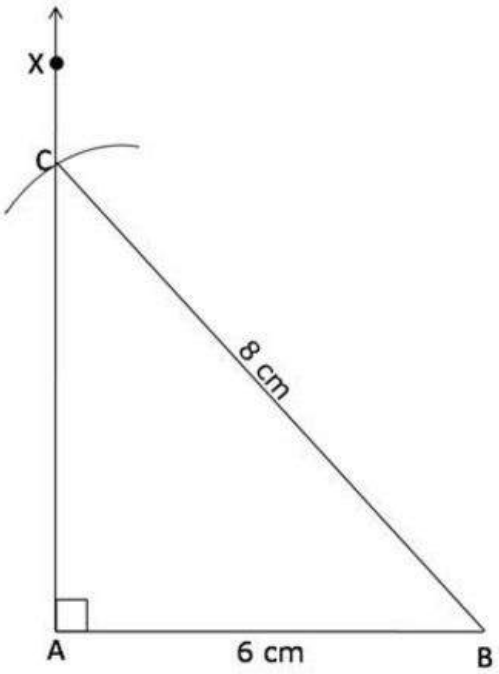
(2) Draw $\overline{AX}$ using a set-square.

(3) Place the compass needle on point B and draw an arc of radius 8 cm, intersecting $\overline{AX}$.

(4) Name the point of intersection as C.

(5) Join $\overline{BC}$.

ΔABC is the required triangle.



Solution 2:

Steps for construction:

(1) Draw $\overline{XY}$ of length 4.5 cm.

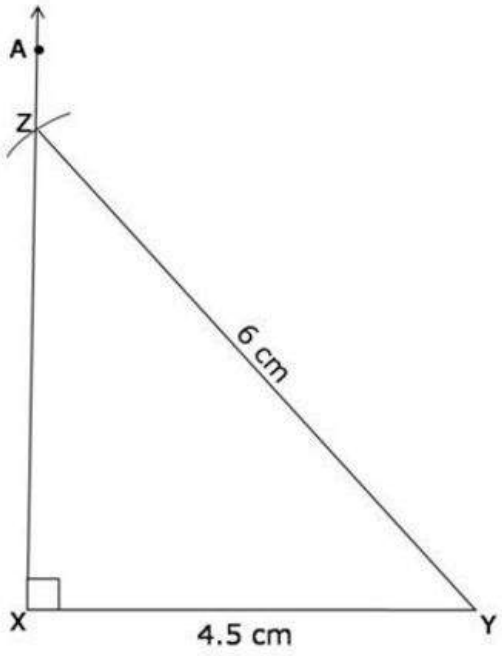
(2) Draw $\overline{XA}$ using a set-square.

(3) Place the compass needle on point Y and draw an arc of radius 6 cm, intersecting $\overline{XA}$.

(4) Name the point of intersection as Z.

(5) Join $\overline{YZ}$.

ΔXYZ is the required triangle.



Solution 3:

Steps for construction:

(1) Draw $\overline{RQ}$ of length 5 cm.

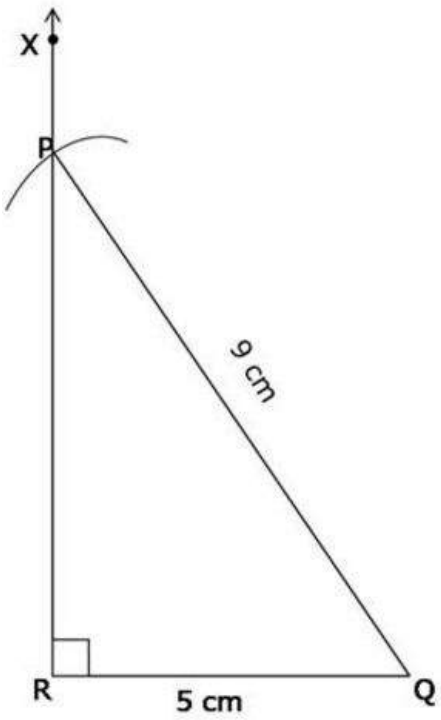
(2) Draw $\overline{RX}$ using a set-square.

(3) Place the compass needle on point Q and draw an arc of radius 9 cm, intersecting $\overline{RX}$.

(4) Name the point of intersection as P.

(5) Join $\overline{PQ}$.

ΔPQR is the required triangle.



Solution 4:

To be done by the student according to the measurements of hypotenuse and one of the sides given by his friend.
Follow the steps of construction of right angled triangle shown in the previous sums.