GEMETRICAL CONSTRUCTION - CHAPTER- 13

EXERCISE 13

ANSWER1

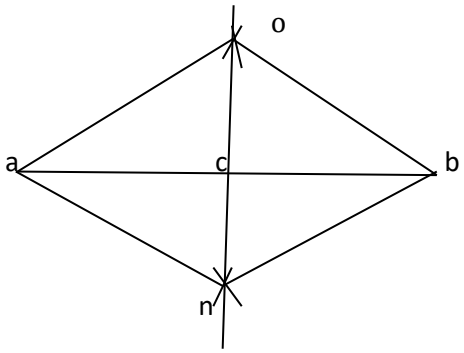
(i) Draw a line segment 5.6 AB

(ii) Suppose with A as centre and a radius equal to more than half of AB, draw 2 arcs , one below the AB & one above the AB.

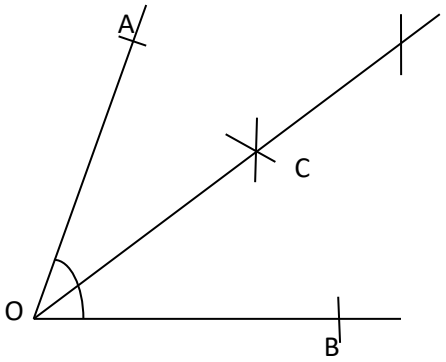
(iii) Suppose with B as centre and same radius , draw 2 arcs , cutting the previously drawn arcs at points O and N respectively

(iv) Join ON, intersecting AB at a C. then ON is the required perpendicular bisector of AB at point C.

On measuring we get ,
CA = 2.8 and CD = 2.8
Also. Right angle Δ
$\angle AC0 = \angle BCO = 90°$



ANSWER2



(rough idea)

(i) Draw a line OB

(ii) With taking center as O , with the help protractor draw arc at 80°

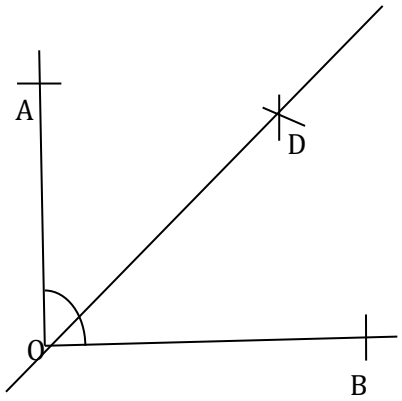
(iii) Now taking O as center , using of compass draw an intersecting arc at C.

(iv) Draw a straight line to join OC. Here, $\angle AOB = 80°$

After bisection of $\angle O$, we get the $1/2\angle O = 40°$

$\angle AOC = \angle BOC = 40°$

ANSWER3



(i) Draw a line OB
(ii) With taking center as O , with the help protractor draw arc at 90°
(iii) Now taking O as center , using of compass draw an intersecting arc at D.
(iv) Draw a straight line to join, OD , here angle is equally divided into 2 parts
So, $\angle AOB = 90°$
$1/2\angle AOB = 45°$

ANSWER4

Construct angles should be down by ruler and compasses.

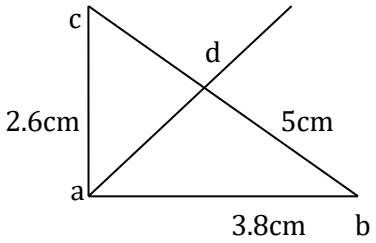
ANSWER5

Rough idea

In $\triangle ABC$, Given $BC = 5cm$, $AB = 3.8cm$, $AC = 2.6cm$

(i) Draw a line segment $AB = 3.8cm$
(ii) With A as center draw radius of 2.6 at point C draw an arc
(iii) With B as centre draw line of radius of 5cm , draw another arc cut the previous one.
(iv) Join AC , BC , Then $\triangle ABC$ is the required.
(v) Clearly, the opp angle is the largest one, so $\angle B$ is the largest one.
(vi) So, we draw BD , the bisector of $\angle B$.

On measuring we find that $\angle ABD = \angle CBD = 20°$



ANSWER6

Rough idea

(i) Draw line segment BC = 4.8cm (base of the triangle)

(ii) With B as center draw an angle of 45° as given ∠B = 45°

(iii) With c as center draw an angle of 75° as given ∠C= 75°

(iv) So, there is point where both angle is intersect each other, that point will be A or A°.

(v) Join lines to make △ABC .

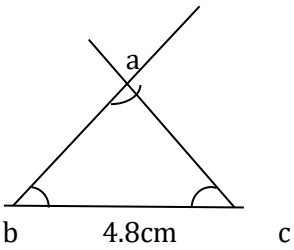
As we know that , sum of the all angles of a triangle be 180°

∠A+∠B+∠C = 180

∠A + 45+75 = 180

∠A = 180 – 45 -75

∠A = 60°



ANSWER7

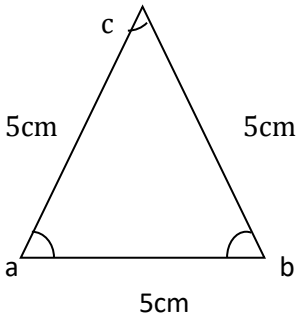
(i) Draw a line AB of radius of 5cm (given)

(ii) With A as centre draw an arc at C of radius 5cm.

(iii) With B as centre draw an arc at C of radius 5cm

(iv) Join all the point We get △ABC

All the angles will be 60°



ANSWER8

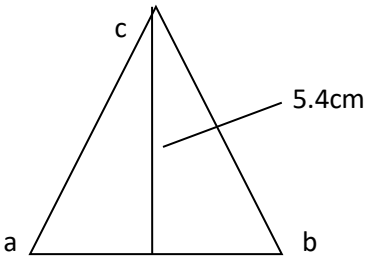
(i) Draw a line AB. (suppose)

(ii) With A as centre draw an arc at C.

(iii) With B as centre draw an arc at C.

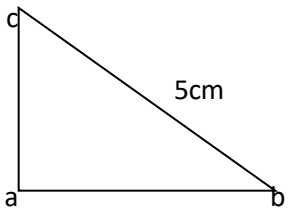
(iv) On line AB⊥CD , where CD = 5.4cm

So, AD = DB and AC = CB



ANSWER9

(i) Draw a line of length 4.5cm as AB△
(ii) With as centre A draw 90° angle to C.
(iii) With as centre B draw hypotenuse of 5cm at C.
(iv) Join, AC and BC.



ANSWER10

given, In △ABC,
BC=4.5cm, ∠B= 45° and AB+AC = 8cm.
∴ (AB +AC)< BC
Thus, the sum of two sides of the triangle is not greater than the third side.
Hence, the construction of △ABC is not possible.

ANSWER11

Given, In △ABC
AB =5.8cm, ∠B = 60° and BC+CA = 8.4cm
∴ (BC +CA) >AC
Thus, the sum of two sides of the triangle is not greater than the third side.
Hence, the construction of △ABC is possible.

ANSWER12

Given, In △ABC
BC=6cm, ∠B= 30° and AB-AC=3.5cm
∴ (AB +AC)> BC
Thus, the difference of two sides of the triangle is not less than the third side.
Hence, the construction of △ABC is not possible.

ANSWER13

In given △ABC
AB=5cm, ∠A=30° , AC-BC = 2.5cm
∴ (AC -BC)< AB
Thus, the difference of two sides of the triangle is not less than the third side.
Hence, the construction of △ABC is not possible.

ANSWER14

(i) Draw a line segment XY= 12cm
(ii) Draw a ray XZ, making an actue angle with XY and drawn in the downward direction.
(iii) From x, set off (3+2+4)=9 equal distances along XZ.
(iv) Mark points L, M,N on XZ such that XL=3 Units, LM = 3units and MN = 4units
(v) Join NY
(vi) Draw LB‖NY and MC‖NY, cutting XY at B and C respectively,
(vii) With B as centre and radius CY draw another arc, cutting the previous arc at A.
(viii) Join AB and AC.

Then, $\triangle ABC$ is required triangle.

Verification:
On measuring , we find that
AB= 4.5cm, BC= 3cm, CA = 6cm
$\therefore$ AB:BC:CA = 9/2:3:6
= 9:6:12
= 3:2:4

ANSWER15

(i) Draw a line segment = 10.4cm
(ii) Make $\angle PQR = 45°$ and $\angle PQS = 120°$
(iii) Draw the bisectors of $\angle QPR$ and $\angle PQS$ to meet A.
(iv) Draw the perpendicular bisectors of PA and QA to meet PQ at B and C resp.
(v) Join AB and AC
Then, $\triangle ABC$ is the required triangle.

ANSWER16

(i) Draw a line segment = 11.6cm
(ii) Make $\angle PQR = 45°$ and $\angle PQS = 60°$
(iii) Draw the bisectors of $\angle QPR$ and $\angle PQS$ to meet A.
(iv) Draw the perpendicular bisectors of PA and QA to meet PQ at B and C resp.
(v) Join AB and AC
Then, $\triangle ABC$ is the required triangle.

ANSWER17

(i) given, In $\triangle ABC$,
AB=6cm, $\angle A = 40°$ and BC+AC = 5.8cm.
$\therefore$ (BC+AC)<AB
Thus, the sum of two sides of the triangle is not greater than the third side.
Hence, the construction of $\triangle ABC$ is not possible

(ii) In given $\triangle ABC$
AB=7cm, $\angle A = 50°$, BC-AC = 2.5cm
$\therefore$ (BC-AC)< AB
Thus, the difference of two sides of the triangle is not less than the third side.
Hence, the construction of $\triangle ABC$ is not possible.

(iii) In given $\triangle ABC$, BC = 5cm and $\angle A = 60°$, $\angle B = 80°$, $\angle C = 50°$
As we know that sum of all the angles will be $180°$
So, $\angle A + \angle B + \angle C \leq 180°$
$60 + 80 + 50 \nleq 180$
$190 \nleq 180$
Hence, the construction of $\triangle ABC$ is not possible

(iv) Here, (AB +BC) =(4+3) and AC= 7cm….. (given)

∴(AB+BC)= AC

Thus, the sum of two sides is not greater than the third side.

Hence, the construction of △ABC is not possible.

ANSWER18

We can also think as $67.5 = \frac{1}{2} \times 135$

$= \frac{1}{2} \times (90 + 45)$

ANSWER19

(i) Draw a line of 4cm on line segment AB

(ii) With A as centre draw a arc of 4cm at point C i.e perpendicular on point A.

(iii) With B as centre draw a arc of 4cm at point D i.e perpendicular on point B

(iv) With C as centre draw a arc of 4cm point D . which intersection at same distance at D point

(v) Join all the lines AC,CD,BD

ANSWER20

(i) Draw a line segment BC= 3.5cm

(ii) Construct ∠CBX = 90°

(iii) From B, set off 5.5cm

(iv) Join CD

(v) Draw the penpendicular bisector of CD, intersecting BD at A.

(vi) Join AC

Then, △ABC is the required right triangle.

Verification,

On measuring , we find that

AC+BC = 5.5cm

ANSWER21

Given, in △ABC ∠B=45° ∠C=60° and the ⊥ from the vertex A to base BC is 4.5cm

(i) Draw a line segment PQ

(ii) From any point D on line PQ , we draw DE⊥PQ

(iii) Cut off DA =4.5cm along DE.

(iv) Through A draw LM∥PQ.

(v) Construct ∠LAB=45° and ∠MAC = 60°,

Meeting PQ at B and C respevtively.

Then, △ABC is required triangle.