Chapter 10

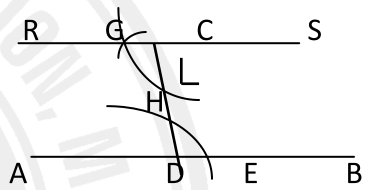
Practical Geometry

SOLUTIONS:

Exercise 10.1

Q1. Draw a line say AB , take a point C outside it . Through C , draw a line parallel to AB using ruler and compass only.

Ans :



Step 1 : A line AB is drawn and a point C is marked outside it .

Step 2 : Line CD is drawn with any point D on AB.

Step 3 : Two arcs with same radius and centres at C and D are drawn.

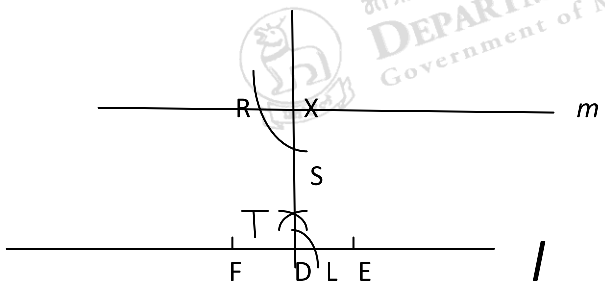
Step 4 : Point G is marked on the arc with centre C such that LG = EH.

Step 5 : A line RS is drawn passing G and C.

RS is the required line parallel to AB.

Q2. Draw a line *l* , . Draw a perpendicular to *l* at any point on *l*. On this perpendicular choose a point X, 4 cm away from *l* . Through X , draw a line m parallel to *l* .

Ans :



Step 1 : Line *l* is drawn. F , D and E are marked on *l* such that FD = DE .

Step 2 : Two arcs of same radius drawn from centres F and E intersect at a point. A line is drawn from D passing through that point which is the required perpendicular line.

Step 3 : A point X is marked on that perpendicular such that DX = 4cm.

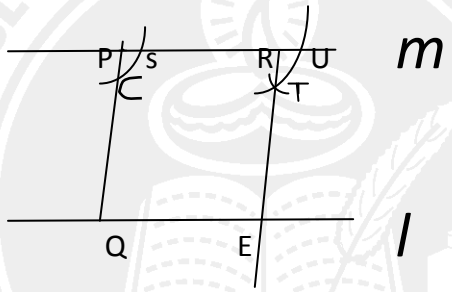
Step 4 : Two arcs of same radius and centres D and X are drawn . A point R is marked on the arc with centre X such that SR = LT.

Step 5 : A line is drawn passing through X and R.

This line RX is the required line.

Q3. Let *l* be a line and P be a point not on *l* .Through P , draw a line m parallel to *l* . Now join P to any point Q on *l* . Choose any other point R on *m* . Through R draw a line parallel to PQ. Let this meet *l* at S . What shape do the two sets of parallel lines enclose ?

Ans :



Step 1 : A line *l* is drawn , a point P is marked not on *l*, another line *m* is drawn passing through P and parallel to *l*. R is marked on a point on the line *m*.

Step 2 : Two arcs of same radius are drawn at the centres P and R. An arc is drawn on the arc with centre R such that UT = SC .

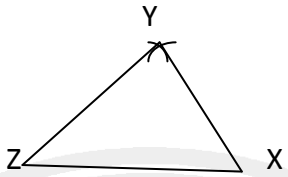
Step 3 : A line is drawn from R passing through T intersecting *l* at E. RE is parallel to PQ.

The shape of the enclosed region is parallelogram .

Exercise 10 .2

Q1. Construct $\triangle$ XYZ in which XY = 4.5 cm, YZ = 5 cm and ZX = 6cm

Ans:



Step1 : A line segment XZ = 6 cm is drawn.

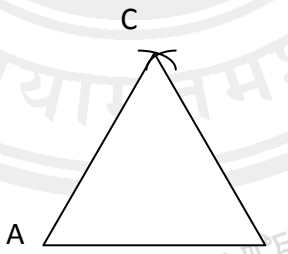
Step 2 : An arc of radius 5 cm is drawn with centre Z . Another arc of radius 4.5 cm is drawn intersecting the previous at Y.

Step 3 : XY and ZY are joined.

$\triangle$ XYZ is the required triangle .

Q2. Construct an equilateral triangle of side 5.5 cm

Ans :



Step 1 : AB = 5.5 cm is drawn .

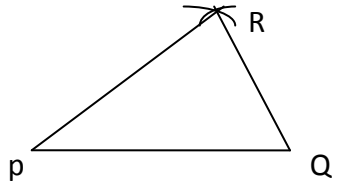
Step 2 : Two arcs of same radius 5.5cm are drawn with centres A and B which intersect at a point C .

Step 3 : BC and AC are joined.

$\triangle$ ABC is the required triangle.

Q3. Draw $\triangle PQR$ with PQ =4 cm , QR = 3.5 cm and PR = 4 cm . What type of triangle is this ?

Ans :



Step 1 : PQ = 4cm is drawn.

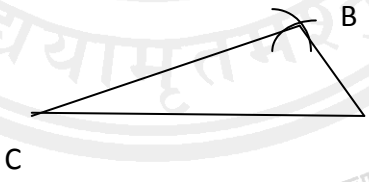
Step 2 : Two arcs of radius 3.5 cm and 4 cm are drawn with centres Q and P respectively intersecting each other at R.

Step 3 : PR and RQ are joined .

$\triangle$ PQR is the required triangle . The type of this triangle is isosceles.

Q4. Construct $\triangle ABC$ such that AB = 2.5 cm , BC = 6 cm and AC = 6.5 cm . Measure $\angle B$.

Ans :



Step 1 : AC = 6.5 cm is drawn.

Step 2 : Two arcs of radius 2.5 cm and 6 cm are drawn with centres A and C respectively. The arcs intersect at B.

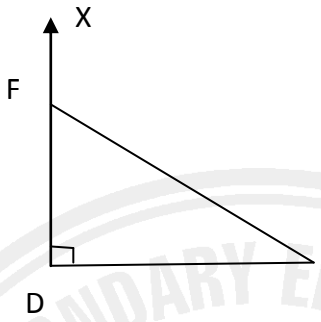
Step 3 : AB and CB are joined .

$\triangle$ ABC is the required triangle . On measuring we get, $m\angle B = 85^0$

EXERCISE 10. 3

Q1. Construct$\triangle$ DEF such that DE = 5cm , DF = 3cm and m $\angle$EDF = 90^0 .

Ans :



Step 1 : DE = 5 cm is drawn .

Step 2 : A ray $\overrightarrow{DX}$ is drawn at D perpendicular to $\overline{DE}$.

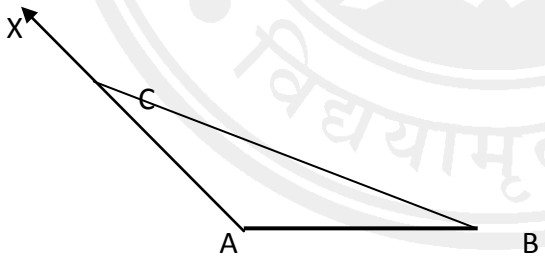
Step 3 : F is marked on $\overrightarrow{DX}$ such that DF = 3cm .

Step 4 : EF is joined .

$\triangle$ DEF is the required triangle.

Q2. Construct an isosceles triangle in which the lengths of each of its equal sides is 6.5 cm and the angle between them is 110^0.

Ans :



Step 1 : AB = 6.5 cm is drawn .

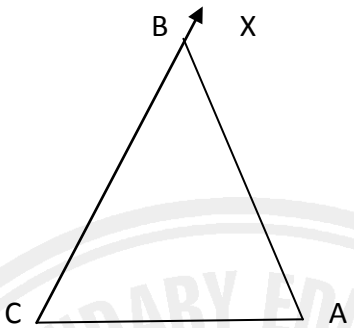
Step 2 : A ray $\overrightarrow{AX}$ is drawn at point A making 110^0 with $\overline{AB}$. A point $\overrightarrow{C}$ is marked on AX such that AC = 6.5 cm.

Step 3 : BC is joined.

$\triangle$ ABC is the required triangle.

Q3 . Construct $\triangle$ ABC with BC = 7.5 cm , AC = 5 cm and m$\angle$C = 60^0.

Ans :



Step 1 : AC = 5cm is drawn .

Step 2 : A ray $\overrightarrow{CX}$ is drawn . A point B is marked on $\overrightarrow{CX}$ such that CB = 7.5 cm .

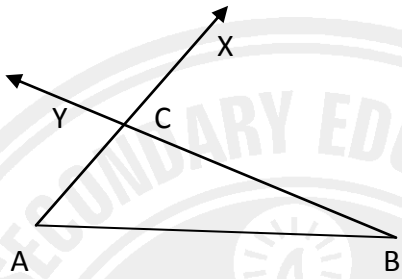
Step 3 : AB is joined.

$\triangle$ ABC is the required triangle.

EXERCISE 10.4

Q1. Construct $\triangle$ ABC , given m$\angle$A = 60^0, m$\angle$ B = 30^0 and AB = 5.8 cm .

Ans :



Step 1 : AB = 5.8 cm is drawn .

Step 2 : A ray $\overrightarrow{AX}$ is drawn at A making an angle 60^0 with $\overline{AB}$. Another ray $\overrightarrow{BY}$ is drawn at B making an angle 30^0 with BA.

Step 3 : The two rays meet at a point C .

$\triangle$ ABC is the required triangle.

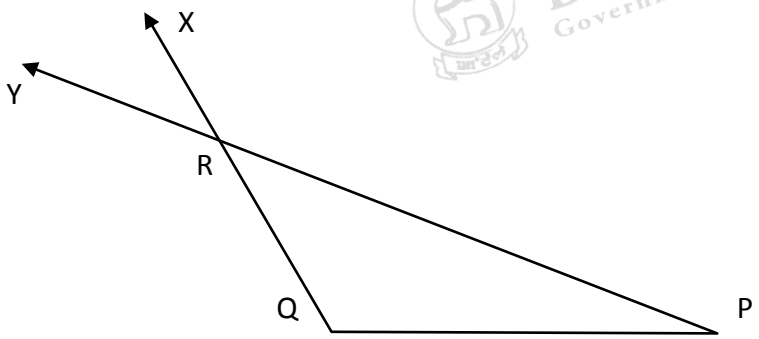
Q2. Construct $\triangle$PQR if PQ = 5cm , m$\angle$PQR = 105^0 and m $\angle$QRP = 40^0.

Ans :

$\angle$ QPR = 180^0 -- $\angle$PQR -- $\angle$PRQ

= 180^0 -- $(105^0 - 40^0)$

= 35^0



Step 1 : PQ = 5 cm is drawn .

Step 2: A ray $\overrightarrow{QX}$ is drawn making 105^0 with $\overline{QP}$. Another ray $\overrightarrow{PY}$ is drawn making 35^0 with $\overline{PQ}$. The two rays intersect at a point R . We get a triangle .

$\triangle$ PQR is the required triangle.

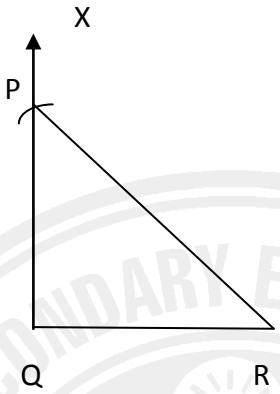
Q3. Examine whether you can construct $\triangle$DEF such that EF = 7.2 cm , m $\angle$E = 110^0 and m$\angle$F = 80^0 . Justify your answer.

Ans : We cannot construct. The sum of the three angles of a triangle is always 180^0 . But here two angles make up 180^0 .

Exercise 10.5

Q1. Construct the right angled $\triangle PQR$, where $m\angle Q = 90^0$,QR = 8cm and PR = 10 cm .

Ans :



Step 1 : QR = 8 cm is drawn .

Step 2 : A ray $\overrightarrow{QX}$ is drawn at Q perpendicular to QR.

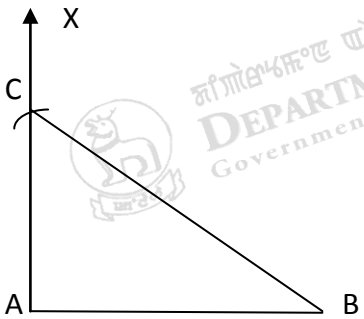
Step 3 : An arc of radius 10 cm with centre R is drawn intersecting the ray $\overrightarrow{QX}$ at a point P.

Step 4 : RP is joined . We get a triangle.

$\triangle$ PQR is the required triangle.

Q2. Construct a right angled triangle whose hypotenuse is 6cm long and one of the legs is 4 cm.

Ans :



Step1 : AB = 4 cm is drawn .

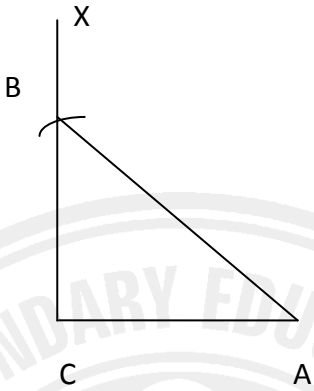
Step 2 : A ray $\overrightarrow{AX}$ is drawn at A perpendicular to AB.

Step 3 : An arc of radius 6cm with centre B is drawn intersecting $\overrightarrow{AX}$ at a point C.

Step 4 : BC is joined and we get a triangle which is the required triangle.

Q3. Construct an isosceles right angled triangle ABC , where m$\angle$ACB = 90^0 and AC = 6 cm.

Ans :



Step 1 : CA = 6cm is drawn .

Step 2 : CX > 6 cm is drawn at C perpendicular to CA .

Step 3 : An arc of radius 6cm is drawn with centre C intersecting $\overline{CX}$ at a point B.

Step 4 : AB is joined . We get a triangle .

$\triangle$ ABC is the required triangle .