Chapter 10

Practical Geometry

We will learn to draw parallel lines and some types of triangles.

Construction of a line parallel to a given line

• Draw a line segment land mark a point A not lying on it.

• Take any point B onland join B to A.

• With B as centre and convenient radius, draw an arc cutting at C and AB at D.

• Now with A as centre and the same radius as in above step draw an arc EF cutting AB at G.

• Place the metal point of the compasses at C and adjust the opening so that the pencil point is at D.

• With the same opening as in above step and with Gas centre draw another arc cutting the arc EF at H.

• Now join AH and draw a line m.
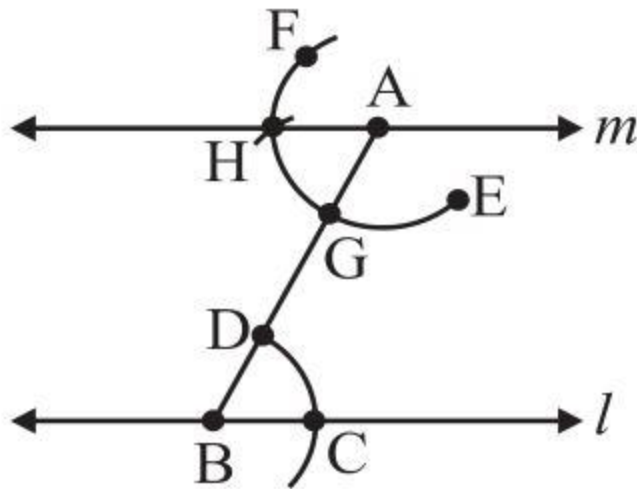
Construction of Triangles

Important properties concerning triangles

(i) The exterior angle of a triangle is equal in measure to the sum of interior opposite angles.

(ii) The total measure of the three angles of a triangle is 180°.

(iii) Sum of the lengths of any two sides of a triangle is greater than the length of the third side.

(iv) In any right-angled triangle, the square of the length of hypotenuse is equal to the sum of the squares of the lengths of the other two sides.

SSS Criterion

Construct a triangle ABC, given that AB = 5 cm, BC = 6 cm and AC = 7 cm.

• Draw a line segment BC of length 6 cm.

• From B, point A is at a distance of 5 cm. So, with B as centre, draw an arc of radius 5 cm.

• From C, point A is at a distance of 7 cm. So, with C as centre, draw an arc of radius 7 cm.

• A has to be on both the arcs drawn. So, it is the point of intersection of arcs. Mark the point of intersection of arcs as A. Join AB and AC. ΔABC is now ready
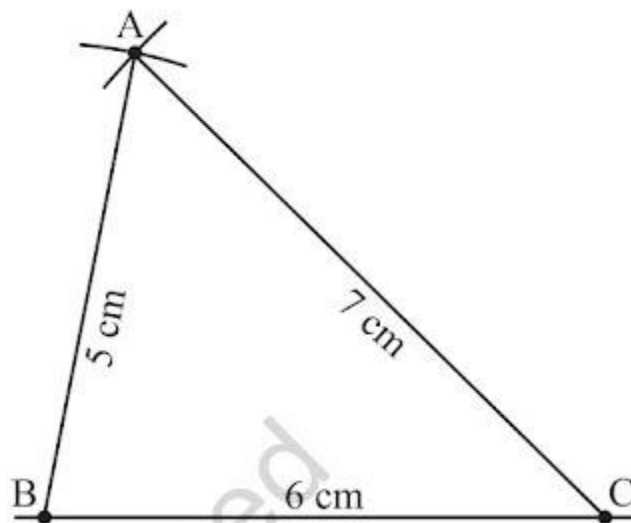
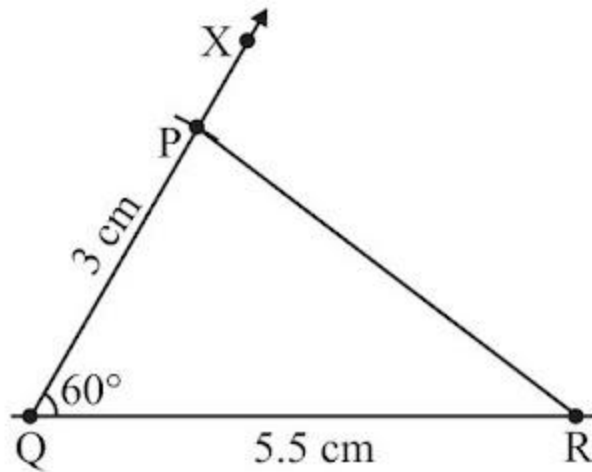**SAS Criterion**

Construct a triangle PQR, given that PQ = 3 cm, QR = 5.5 cm and ∠PQR = 60°.

• Draw a line segment QR of length 5.5 cm.

• At Q, draw QX making 60° with QR. (The point P must be somewhere on this

ray of the angle)

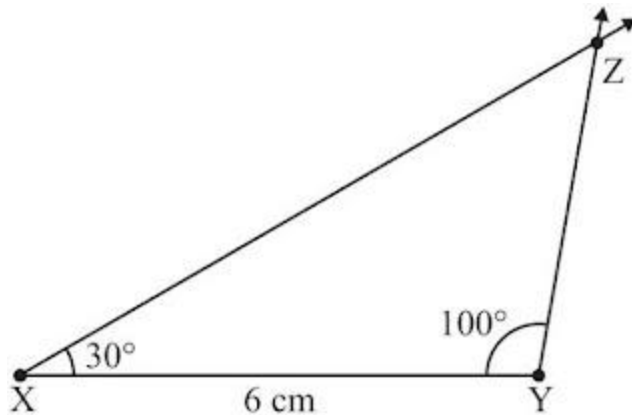• With Q as centre, draw an arc of radius 3 cm. It cuts QX at the point P.

• Join PR. ΔPQR is now obtained.

ASA Criterion

Construct ΔXYZ if it is given that XY = 6 cm, m∠ZXY = 30° and m∠XYZ = 100°.

• Draw XY of length 6 cm.

• At X, draw a ray XP making an angle of 30° with XY. By the given condition Z must be somewhere on the XP.

• At Y, draw a ray YQ making an angle of 100° with YX. By the given condition, Z must be on the ray YQ also.

• Z has to lie on both the rays XP and YQ. So, the point of intersection of the two rays is Z. ΔXYZ is now completed.

RHS Criterion

Construct ∆LMN, right-angled at M, given that LN = 5 cm and MN = 3 cm.

• Draw MN of length 3 cm.

• At M, draw MX ⊥ MN. (L should be somewhere on this perpendicular)

• With N as centre, draw an arc of radius 5 cm. (L must be on this arc, since it is at a distance of 5 cm from N)

• L has to be on the perpendicular line MX as well as on the arc drawn with centre N. Therefore, L is the meeting point of these two. ∆LMN is now obtained.

X

L

M 3 cm N