Exercise 5.5

(Use ruler and compass only to construct each of the following triangles)

1. Construct a triangle ABC in which AB = 4.5 cm, BC = 3 cm and AC = 4.5 cm.
2. Construct a triangle ABC in which AB = 4.5 cm, $\angle A = 30°$, and AC = 3.8 cm.
3. Construct a triangle ABC in which BC = 4.4 cm, $\angle A = 75°$ and $\angle B = 60°$.
4. Construct a triangle ABC in which AB = 7 cm, BC = 6.5 cm and $\angle CAB = 60°$.
5. Construct a right–angled triangle whose longest side is 5.6 cm and another side is 3.2 cm.
6. Construct an equilateral triangle with one side 3.5 cm.
7. Construct an isosceles triangle with base BC = 6.2 cm and altitude = 4.8 cm.
8. Construct an isosceles triangle with base BC = 5.8 cm and vertical angle 75°.
9. Construct an isosceles right-angled triangle whose hypotenuse is 7 cm.
10. Construct an isosceles triangle with base 2.8 cm and vertical angle = 30°.

Construction Problems: A geometrical construction combines both reasoning and skill. When you are asked to construct a figure, it requires understanding of properties of figure, reasoning power and skill in using a straight edge and compass.

A solution to the construction problem may be divided into the following parts.

1. **Restatement:** The given geometrical problem may be restated to specify clearly
   (*i*) What is given? (*ii*) What is required?
2. **Steps of construction:** When you are asked to construct a figure, you should always explain your construction in words. Write the sequence of steps that you actually take.

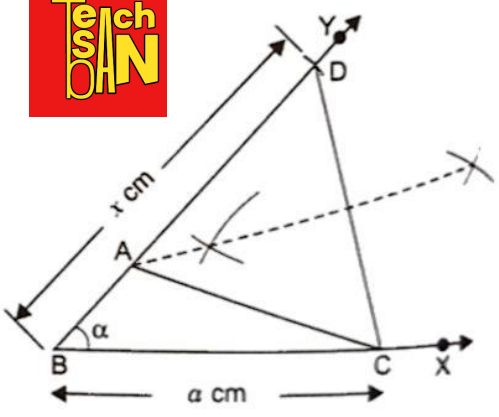
Constructions of Triangles

Construction 1. To construct a triangle, given the base, sum of the other two sides and one base angle:

Given: In Δ ABC, base BC = a cm, sum of the other two sides *i.e.*,

AB + AC = x cm and $\angle ABC = \alpha$.

Required: To construct ΔABC.



Steps of Construction:

1. Draw a ray BX and cut off a line segment BC = a cm from it.
2. At B, construct $\angle XBY = \alpha$.
3. With B as centre and radius = x cm, draw an arc to meet BY at D.
4. Join CD.
5. Draw the perpendicular bisector of CD, intersecting BD at A.
6. Join AC. Then, ABC is the required triangle.