CBSE Class 9 Maths Notes Chapter 11: CBSE Class 9 Maths Notes Chapter 11 describes how to draw various forms with a ruler and compass. This chapter explains how to construct the bisector of a given angle and how to construct a perpendicular bisector of a given line segment.

Construction instructions and a clear illustration are provided. To get good grades, you should also complete all of the class 9 Maths Chapter 11 building problems in the textbook.

CBSE Class 9 Maths Notes Chapter 11

The important topics and subtopics covered under constructions class 9 are:

- Introduction
- Basic constructions
- Some constructions of triangles
- Summary

Linear Pair axiom

- The neighbouring angles create a linear pair of angles if a ray is on a line.
- Uncommon arms of both angles make a straight line if two angles create a linear pair.

Triangle Constructions

Construction of Triangles

To make a triangle, at least three elements must be provided; however, not every combination of three parts will work.
Consequently, if the following triangle components are available, a unique triangle can be created:

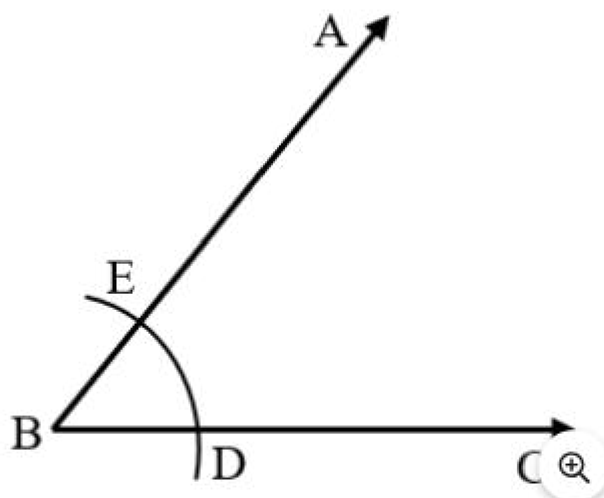
- There are two sides and an integrated angle.
- There are three sides provided.
- There are two angles and a given included side.
- A right triangle has one side and a hypotenuse.
- It is not always possible to build such a triangle uniquely given two sides and an angle (not the included angle).

The only tools needed to draw geometrical constructions are a compass and an ungraduated ruler known as a straight edge. A graded scale and a protractor may also be used occasionally when the measurements are also necessary.

Basic constructions:

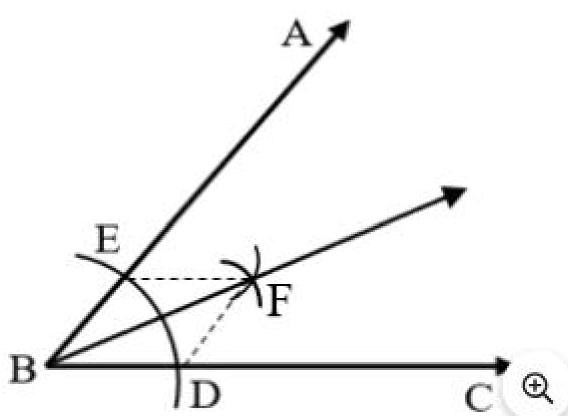
To create the bisector of a specified angle, take a ∠ABC and divide it in half. These are the actions that had to be taken:

Using B as the centre, draw an arc of any radius that intersects the rays BA and BC at E and D, respectively.



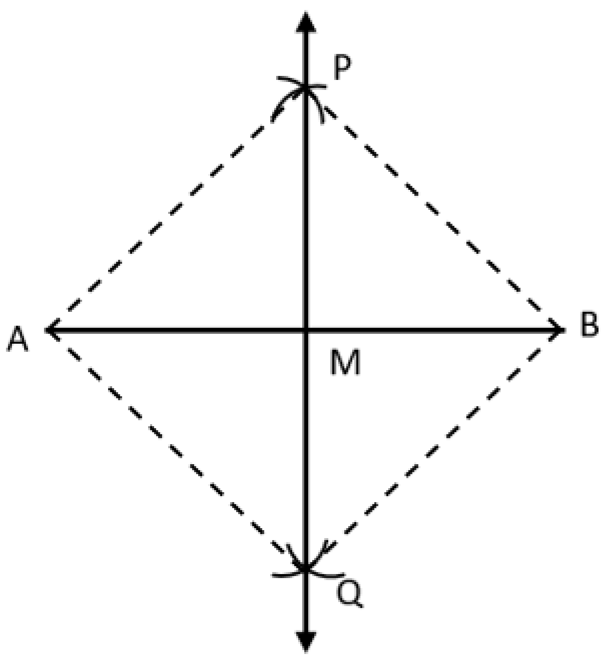
Create arcs with E and D as their centres and a radius greater than 1 by 2 DE so that they cross at F.

Create a ray that now connects B and F and extends it. Therefore, the necessary angle bisector is BF.



To construct the perpendicular bisector of a given line segment – Let us have a line segment $\overline{AB}$, for which we will draw a perpendicular bisector. The steps to be followed are as follows;

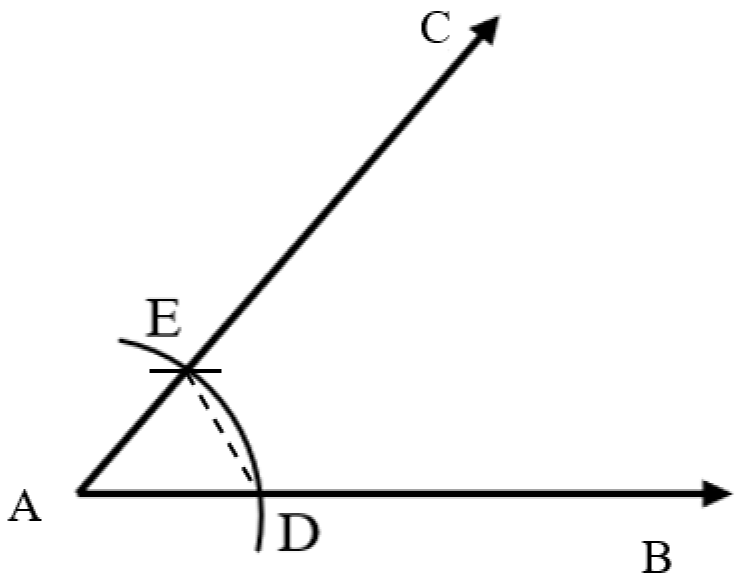
1. Taking A and B as centres, draw arcs on both sides of the line segment with radius more than $\frac{1}{2}AB$. The arcs drawn should intersect each other.
2. Let us say that the arcs intersect at points P and Q respectively. Join P and Q.
3. Let's say that the line $\overleftrightarrow{PQ}$ intersects the segment $\overline{AB}$ at point M. Then the line PMQ is the required perpendicular bisector.



To create a 60◦ angle at a given ray's starting point, take a ray AB with an initial point of A. From there, draw another ray AC so that ∠BAC=60◦. The actions that need to be taken are as follows:

Using A as the centre, sketch an arc that intersects the ray AB at point D. Now, draw two arcs that intersect at a point, let's say E, using A and D as the centres and AD as the radius.

Connect AE and extend it to the point C on the AC ray. Therefore, CAB=60◦.



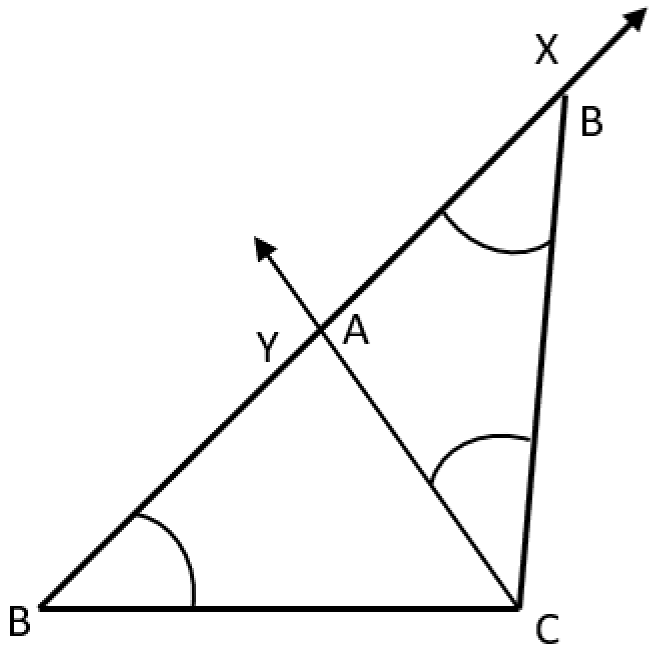
Some Construction of Triangles:

To create a triangle, measurements of at least three of its components are needed. However, none of the three element combinations are sufficient for the goal. For instance, given the dimensions of the aspects and an uncovered perspective among the offered aspects, it is not possible to create a totally unique triangle.

When (i) the base, one base attitude, and the total of the opposing aspects are provided, a triangle can be constructed. (ii) the basis, a foundational mindset, and the differentiation between the opposing elements are provided (iii) The base and perimeter angles are provided.

To construct a triangle, given its base, a base angle and sum of other two sides – Let us suppose, we have to draw ΔABC, whose base BC and $\angle B$ is given. And the sum $AB + AC$ is also given. The required triangle will be constructed in the steps as follows;

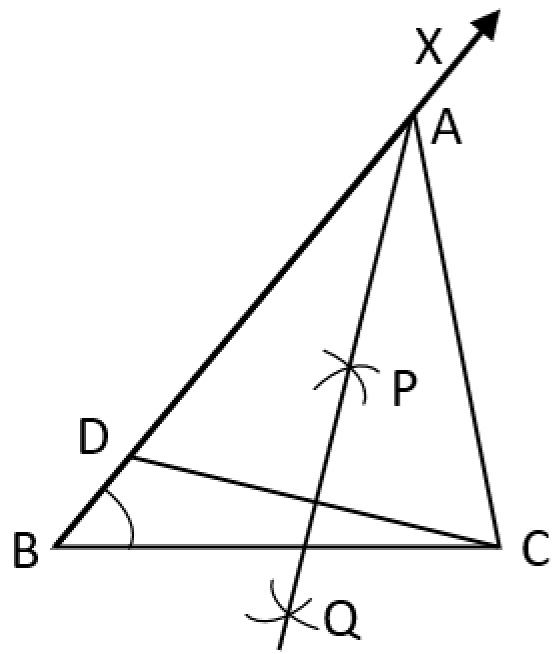
1. First draw the base BC and then make $\angle CBX$ same as the angle given to us at point B.
2. Now, mark a point D on the ray BX such that $BD = AB + AC$.
3. Then Join DC. Construct $\angle DCY$ such that it is equal to $\angle BDC$.
4. Let us say that the ray CY intersects BD at point A. Then ΔABC is the required triangle.



To construct a triangle given its base, a base angle and the difference of the other two sides – Let us say, we have to construct ΔABC, of which the base BC, one base angle $\angle B$ and the difference of other two sides either $AB - AC$ or $AC - AB$ are given. This may have two cases as follows;

Case (i): When $AB > AC$

1. First draw the base BC and then make $\angle CBX$ same as the angle given to us at point B.
2. Now, mark a point D on the ray BX such that $BD = AB - AC$.
3. Draw the perpendicular bisector of line CD, say PQ when extended cut the ray BX at A. Hence, ΔABC has been constructed.

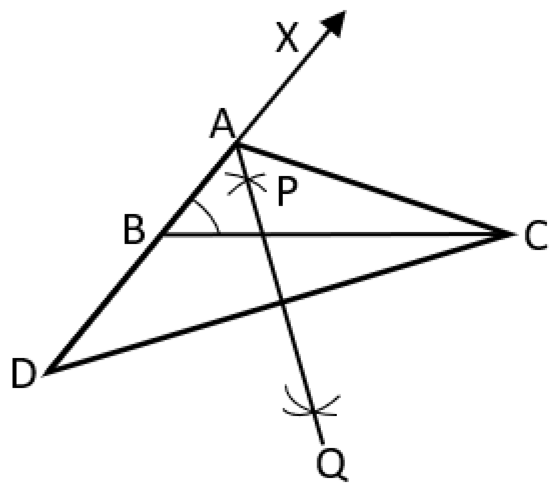


Case (ii): When $AB < AC$

1. First draw the base BC and then make $\angle CBX$ same as the angle given to us at point B.

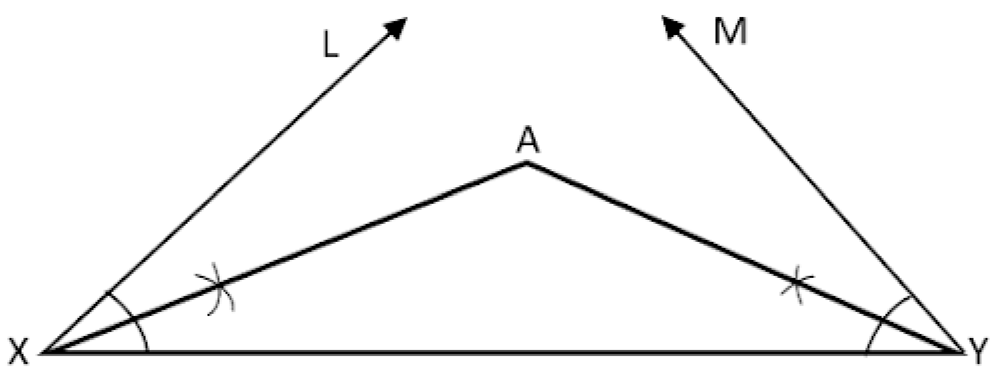
2. Now, mark a point D on the ray BX extended on opposite side of BX such that $BD = AC - AB$.

3. Draw the perpendicular bisector of line CD, say PQ when extended cut the ray BX at A. Hence, ΔABC has been constructed.

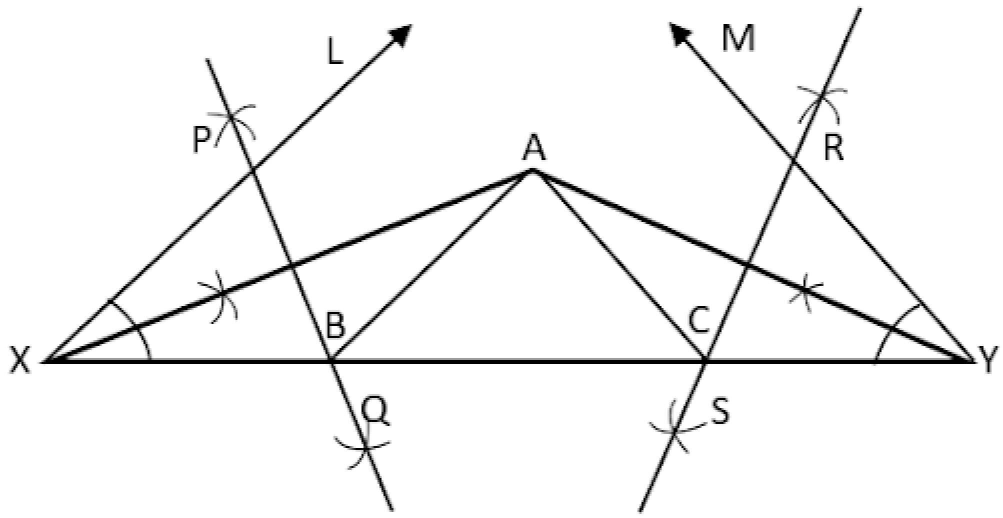


To construct a triangle, given its perimeter and its two base angles – Construct ΔABC when the base angles $\angle B$ and $\angle C$ and the perimeter $AB + BC + CA$ are given. The steps need to be followed are as follows;

1. Draw XY that is equal to $AB + BC + CA$.
2. Then make $\angle LXY = \angle B$ and $\angle MYX = \angle C$.
3. Bisect the angles $\angle LXY$ and $\angle MYX$ such that the bisectors meet at point A.



4. Now, construct perpendicular bisectors PQ and RS of AX and AY respectively.
5. Suppose PQ intersect XY at B and RS intersect XY at C. Then, join AB and AC. Hence, we get the required ΔABC.



Benefits of CBSE Class 9 Maths Notes Chapter 11

Concept Clarity: CBSE Class 9 Maths Notes Chapter 11 helps students to understand the chapter better. Students are able to gain a firm grasp of these ideas.

Problem-solving abilities: The notes provide students with a range of practice problems and examples to aid in the development of their problem-solving abilities. Students can strengthen their grasp ideas and develop their problem-solving skills by completing these notes.

Structured Learning: The notes are arranged in a methodical fashion, covering subjects one after the other. This facilitates pupils' ability to learn in a logical manner.

Exam Preparation: CBSE Class 9 Maths Notes Chapter 11 is tailored to match the format of the exams. Students can improve their performance in the mathematics portion and successfully prepare for their exams by going over these notes.