

**CLASS X : CHAPTER - 11**  
**CONSTRUCTIONS**  
**NCERT NICHOD**

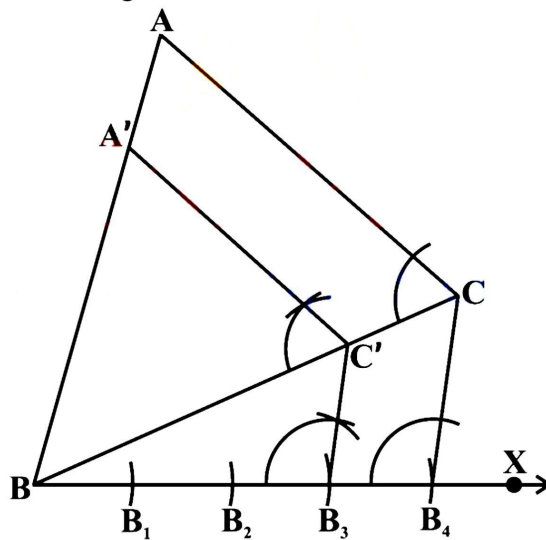
To construct a triangle similar to a given triangle as per given scale factor.

**Example 1** - Construct a triangle similar to a given triangle ABC with its sides equal to  $\frac{3}{4}$  of the corresponding sides of the triangle ABC (i.e., of scale factor  $\frac{3}{4}$ ).

**Steps of Construction :**

- ☞ Draw any ray BX making an acute angle with BC on the side opposite to the vertex A.
- ☞ Locate 4 (the greater of 3 and 4 in  $\frac{3}{4}$ ) points  $B_1, B_2, B_3$  and  $B_4$  on BX so that  $BB_1 = B_1B_2 = B_2B_3 = B_3B_4$ .
- ☞ Join  $B_4C$  and draw a line through  $B_3$  (the 3rd point, 3 being smaller of 3 and 4 in  $\frac{3}{4}$ ) parallel to  $B_4C$  to intersect BC at  $C'$ .
- ☞ Draw a line through  $C'$  parallel to the line CA to intersect BA at  $A'$  (see below figure).

Then,  $\Delta A'BC'$  is the required triangle.

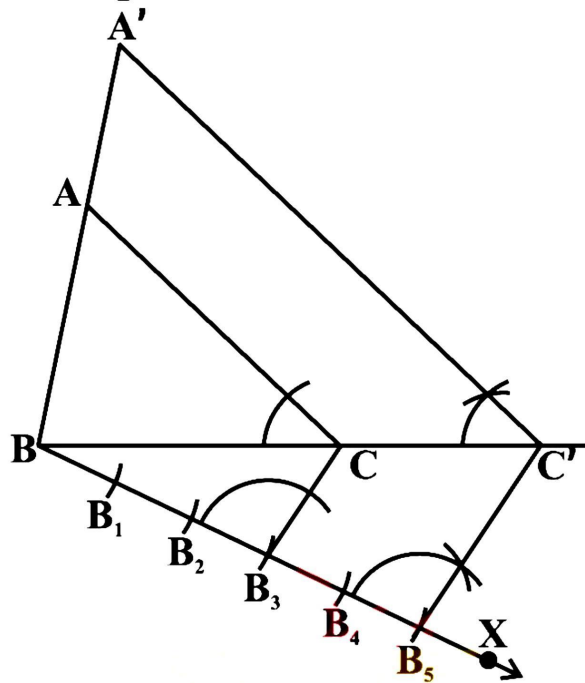


**Example 2** : Construct a triangle similar to a given triangle ABC with its sides equal to  $\frac{5}{3}$  of the corresponding sides of the triangle ABC (i.e., of scale factor  $\frac{5}{3}$ ).

**Steps of Construction :**

- Draw any ray BX making an acute angle with BC on the side opposite to the vertex A.
- Locate 5 points (the greater of 5 and 3 in  $\frac{5}{3}$ )  $B_1, B_2, B_3, B_4$  and  $B_5$  on BX so that  $BB_1 = B_1B_2 = B_2B_3 = B_3B_4 = B_4B_5$ .

- Join  $B_3$  (the 3rd point, 3 being smaller of 3 and 5 in  $\frac{5}{3}$ ) to C and draw a line through  $B_5$  parallel to  $B_3C$ , intersecting the extended line segment BC at  $C'$ .
- Draw a line through  $C'$  parallel to CA intersecting the extended line segment BA at  $A'$  (see the below figure).  
Then  $A'BC'$  is the required triangle.

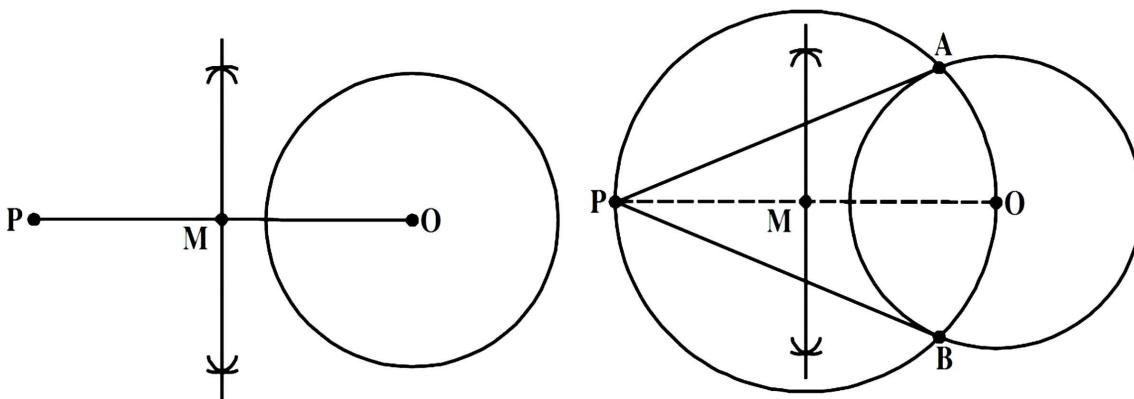


**To construct the tangents to a circle from a point outside it.**

**Given :** We are given a circle with centre 'O' and a point P outside it. We have to construct two tangents from P to the circle.

**Steps of construction :**

- ☞ Join PO and draw a perpendicular bisector of it. Let M be the midpoint of PO.
  - ☞ Taking M as centre and PM or MO as radius, draw a circle. Let it intersect the given circle at the points A and B.
  - ☞ Join PA and PB.
- Then PA and PB are the required two tangents.



**To Construct a tangent to a circle at a given point when the centre of the circle is known.**

We have a circle with centre 'O' and a point P anywhere on its circumference. Then we have to construct a tangent through P.

**Steps of Construction :**

- ☞ Draw a circle with centre 'O' and mark a point 'P' anywhere on it. Join OP.
- ☞ Draw a perpendicular line through the point P and name it as XY, as shown in the figure.
- ☞ XY is the required tangent to the given circle passing through P.

