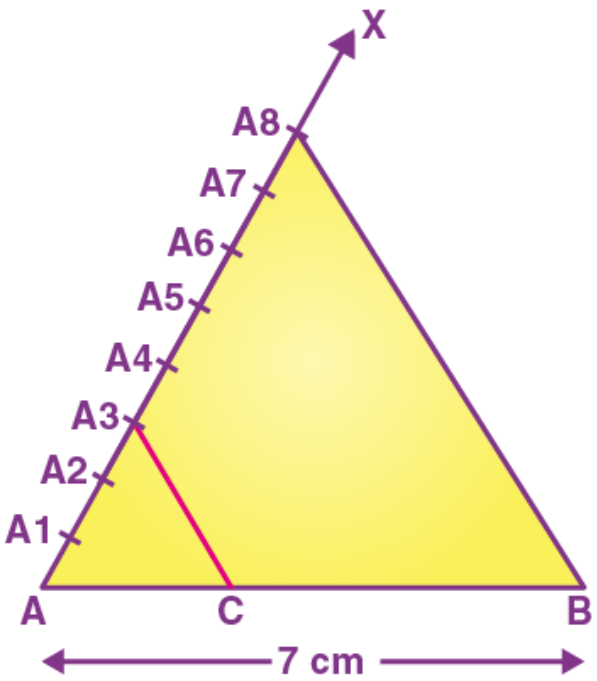
# Important Questions Class 10 Maths Chapter 11 - Constructions

**Q.1: Draw a line segment of length 7 cm. Find a point P on it which divides it in the ratio 3:5.**
**Solution:**
Steps of construction:
**Step 1:** Draw a line segment, AB = 7 cm.
**Step 2:** Draw a ray, AX, making an acute angle downward with AB.
**Step 3:** Mark the points $A_1$, $A_2$, $A_3$ ... $A_8$ on AX.
**Step 4:** Mark the points such that $AA_1 = A_1A_2 = A_2A_3 = .....$, $A_7A_8$.
**Step 5:** Join $BA_8$.
**Step 6:** Draw a line parallel to $BA_8$ through the point $A_3$, to meet AB on P.
Hence AP: PB = 3: 5




**Q.2: Construct a triangle with sides 5 cm, 6 cm and 7 cm and then another triangle whose sides are 7/5 of the corresponding sides of the first triangle.**
**Solution:**

Steps of Construction:

**Step 1:** Draw a line segment AB =5 cm.

**Step 2:** Take A and B as centre, and draw the arcs of radius 6 cm and 7 cm respectively.

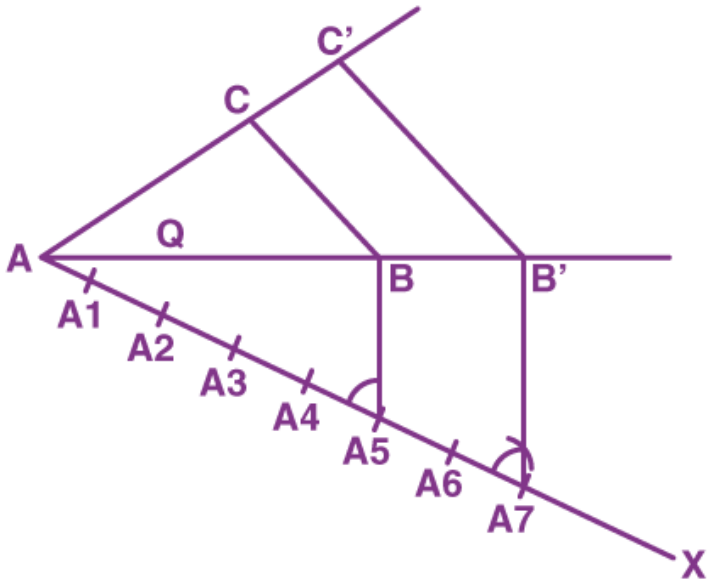
**Step 3:** These arcs will intersect each other at point C, and therefore ΔABC is the required triangle with the length of sides as 5 cm, 6 cm, and 7 cm respectively.

**Step 4:** Draw a ray AX which makes an acute angle with the line segment AB on the opposite side of vertex C.

**Step 5:** Locate the 7 points such as $A_1$, $A_2$, $A_3$, $A_4$, $A_5$, $A_6$, $A_7$ (as 7 is greater between 5and 7), on line AX such that it becomes $AA_1 = A_1A_2 = A_2A_3 = A_3A_4 = A_4A_5 = A_5A_6 = A_6A_7$.

**Step 6:** Join the points $BA_5$ and draw a line from $A_7$ to $BA_5$ which is parallel to the line $BA_5$ where it intersects the extended line segment AB at point B'.

**Step 7:** Now, draw a line from B' the extended line segment AC at C' which is parallel to the line BC and it intersects to make a triangle.




Therefore, ΔAB'C' is the required triangle.

**Q.3: Draw a circle of radius 3 cm. Take two points P and Q on one of its extended diameters, each at a distance of 7 cm from its centre. Draw tangents to the circle from these two points P and Q.**

**Solution:**

Steps of construction:

**Step 1:** Draw a circle with a radius of 3 cm with centre "O".

**Step 2:** Draw a diameter of a circle with endpoints P and Q, and it extends 7 cm from the centre.

**Step 3:** Draw the perpendicular bisector of the line PO and mark the midpoint as M.

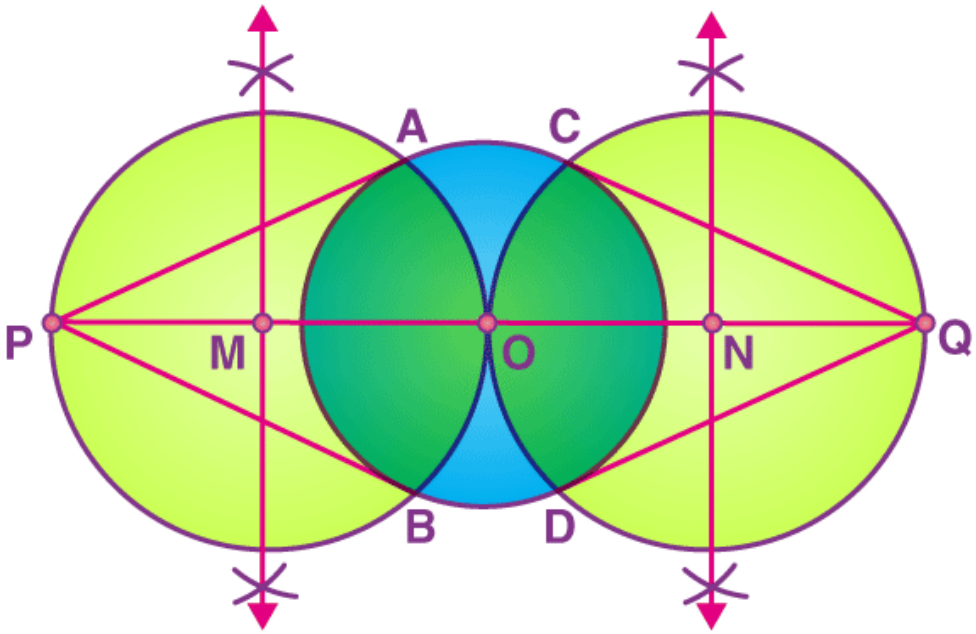
**Step 4:** Draw a circle with M as centre and MO as the radius

**Step 5:** Now join the points PA and PB in which the circle with radius MO intersects the circle at points A and B.

**Step 6:** Now PA and PB are the required tangents.

**Step 7:** Similarly, from point Q, we can draw the tangents.

**Step 8:** From that, QC and QD are the required tangents.




**Q. 4: Draw a circle with the help of a bangle. Take a point outside the circle. Construct the pair of tangents from this point to the circle.**

**Solution:**

Steps of construction:

**Step 1:** Draw a circle with the help of a bangle.

**Step 2:** Draw two non-parallel chords such as AB and CD

**Step 3:** Draw the perpendicular bisector of AB and CD

**Step 4:** Take the centre as O where the perpendicular bisector intersects.

**Step 5:** To draw the tangents, take a point P outside the circle.

**Step 6:** Join the points O and P.

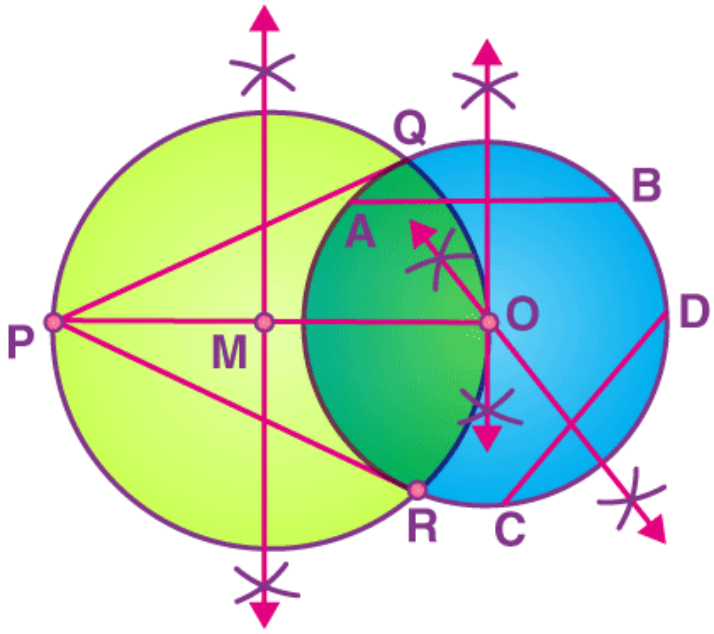
**Step 7:** Now draw the perpendicular bisector of the line PO and the midpoint is taken as M.

**Step 8:** Take M as centre and MO as radius, draw a circle.

**Step 9:** Let it intersect the circle at the points Q and R.

**Step 10:** Now join PQ and PR.

Therefore, PQ and PR are the required tangents.




**Q. 5: Draw two concentric circles of radii 3 cm and 5 cm. Taking a point on the outer circle, construct the pair of tangents to the other. Measure the length of a tangent and verify it by actual calculation.**

**Solution:**

Steps of construction:

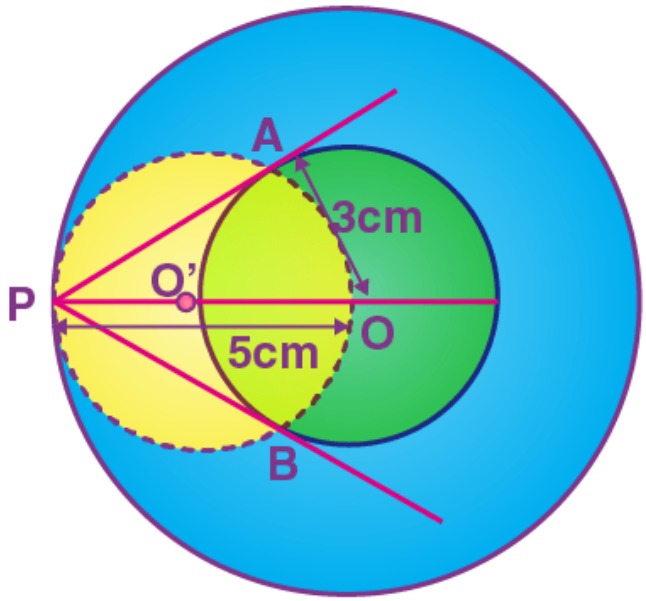
**Step 1:** Draw a circle with centre O and radius 3 cm.

**Step 2:** Draw another circle with centre O and radius 5 cm.

**Step 3:** Take a point P on the circumference of a larger circle and join OP.

**Step 4:** Draw another circle such that it intersects the smallest circle at A and B.

**Step 5:** Join A to P and B to P.




Hence AP and BP are the required tangents.

**Q.6: Draw a line segment AB of length 7 cm. Taking A as the centre, draw a circle of radius 3 cm and taking B as centre, draw another circle of radius 2 cm. Construct tangents to each circle from the centre of the other circle.**

**Solution:**

Steps of Construction:

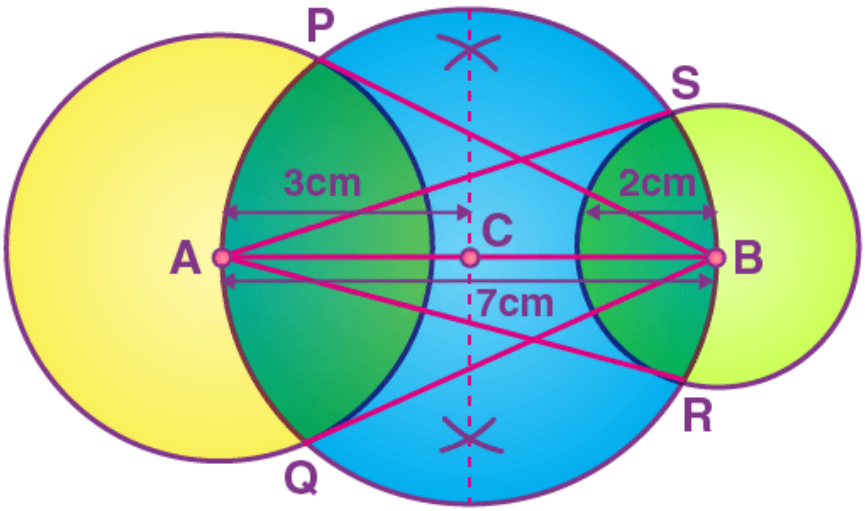
**Step 1:** Draw a line segment AB of 7 cm.

**Step 2:** Taking A and B as centres, draw two circles of 3 cm and 2 cm radius respectively.

**Step 3:** Bisect line AB. Let the midpoint of AB be C.

**Step 4:** Taking C as the centre, draw a circle of radius AC that intersects the two circles at points P, Q, R and S.

**Step 5:** Join BP, BQ, AS and AR.




PB, QB and RA and SA are the required tangents.

**Q.7: Construct an equilateral ΔABC with each side 5 cm. Then construct another triangle whose sides are 2/3 times the corresponding sides of ΔABC.**

**Solution:**

Steps of construction:

**Step 1:** Draw a line segment BC = 5 cm.

**Step 2:** Taking B as centre and radius 5 cm, draw an arc.

**Step 3:** Now, taking C as centre and radius 5 cm, draw another arc meeting the previous arc at point A.

**Step 4:** Now join point AC and BC. Thus ΔABC is the required triangle.

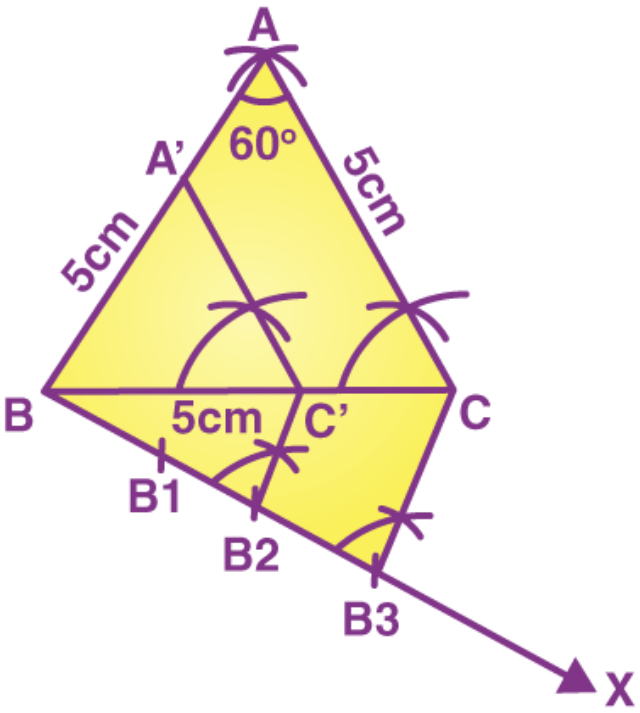
**Step 5:** Draw a line BX such that ∠CBX is an acute angle and is opposite of vertex A.

**Step 6:** Along BX, mark 3 points $B_1$, $B_2$, $B_3$ such that $BB_1 = B_1B_2 = B_2B_3$.

**Step 7:** Now join $B_3$ to C.

**Step 8:** Draw a line $B_2C' \parallel B_3C$

**Step 9:** Draw a line A'C' parallel to AC.




Hence ΔBA'C' is the required triangle.

**Q.8: Construct a triangle ABC with side BC = 7 cm, ∠B = 45°, ∠A = 105°. Then construct another triangle whose sides are 3/4 times the corresponding sides of the ΔABC.**

**Solution:**

In triangle ABC,

$\angle A + \angle B + \angle C = 180^\circ$

$105^\circ + 45^\circ + \angle C = 180^\circ$

$\angle C = 180^\circ - 150^\circ = 30^\circ$

Steps of construction:

**Step 1:** Draw a line segment BC = 7 cm.

**Step 2:** At B, construct a right angle and bisect it such that $\angle B = 45^\circ$.

**Step 3:** Construct an angle 30 degrees at C such that this line intersects the previous angle at A. Thus ΔABC is the required triangle.

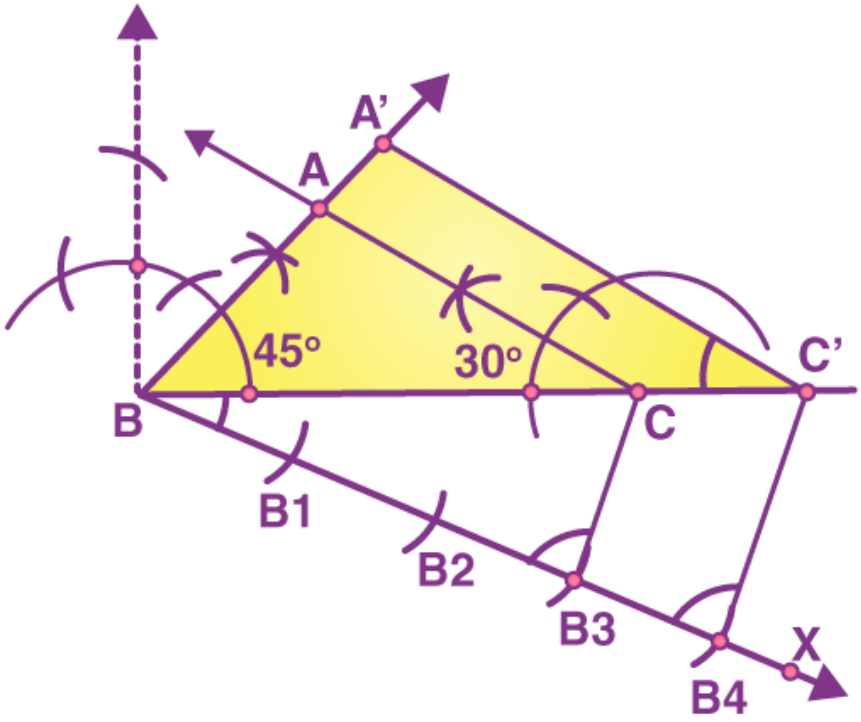
**Step 4:** Draw a line BX such that ∠CBX is an acute angle and is opposite of vertex A.

**Step 5:** Along BX, mark 4 points $B_1$, $B_2$, $B_3$, $B_4$ such that $BB_1 = B_1B_2 = B_2B_3 = B_3B_4$

**Step 6:** Now join $B_3$ to C.

**Step 7:** Draw a line through $B_4$ which is parallel to $B_3C$ such that it intersects the extended BC at C'.

**Step 8:** Draw a line A'C' parallel to AC such that it meets the extended AB at A'.




Hence ΔBA'C' is the required triangle similar to triangle ABC.

**Q.9: Construct a ΔABC in which AB = 6 cm, ∠A = 30° and ∠B = 60°. Construct another ΔAB'C' similar to ΔABC with base AB' = 8 cm.**

**Solution:**

Given, AB = 6 cm and AB' = 8 cm

Scale factor = AB'/AB = 8/6 = 4/3

Steps of construction:

**Step 1:** Draw a line segment AB = 6 cm.

**Step 2:** At A and B, construct angles 30° and 60° respectively and let these lines intersect each other at C. Thus ΔABC is the required triangle.

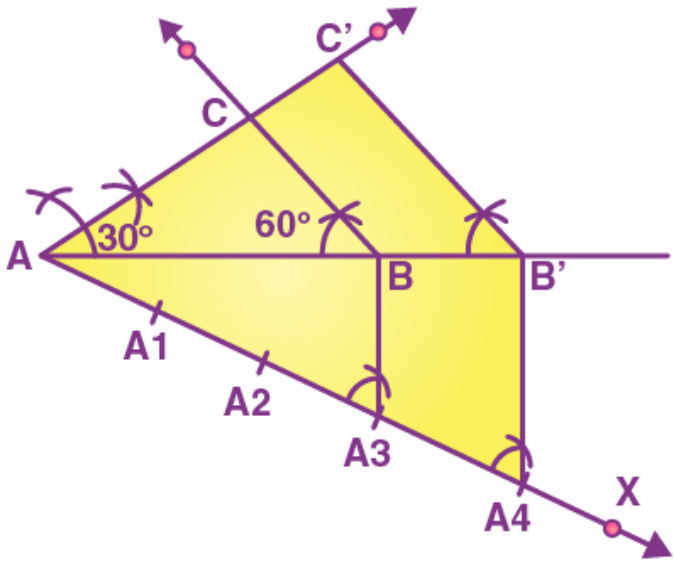
**Step 3:** Draw a line AX such that ∠BAX is an acute angle and is opposite of vertex C.

**Step 4:** Along AX, mark 4 points $A_1$, $A_2$, $A_3$, $A_4$ such that $AA_1 = A_1A_2 = A_2A_3 = A_3A_4$

**Step 5:** Now join $A_3B$.

**Step 6:** Draw a line through $A_4$ which is parallel to $A_3B$ such that it intersects the extended AB at B'.

**Step 7:** Draw a line B'C' parallel to BC such that it meets the extended AC at C'.




Hence ΔBA'C' is the required triangle similar to triangle ABC.

**Q.10: Draw a circle of radius 4 cm. Draw two tangents to the circle inclined at an angle of 60° to each other.**

**Solution:**

Given,

Radius = 4 cm

Angle between two tangents = 60

Angle at the centre = 2 × 60 = 120

Steps of construction:

**Step 1:** Draw a circle with a radius of 4 cm.

**Step 2:** Draw two radii OA and OB such that the angle between these radii is 120 degrees.

**Step 3:** Draw PA perpendicular to OP and PB perpendicular to OB (since the tangent is perpendicular to the tangent at the point of contact).

**Step 4:** PA and PB are the required tangents inclined to each other at an angle of 60°.