Important Questions & Answers For Class 10 Maths

Chapter 11 Constructions

Students can have a look at the CBSE Class 10 Maths Important Questions Chapter 11 on Construction and their answers below. For more practice, we have also provided a few more questions at the end of this page.

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.

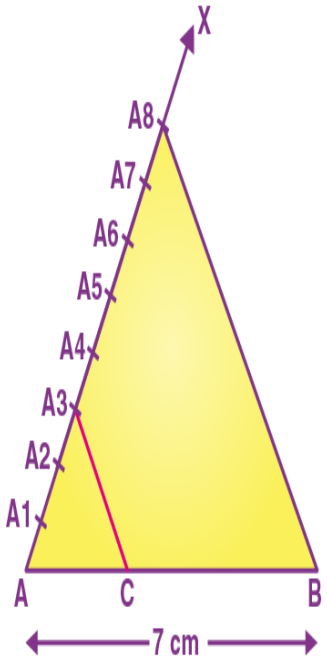
Step 3: Mark the points A_1, A_2, A_3 ... A_8 on AX.

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.

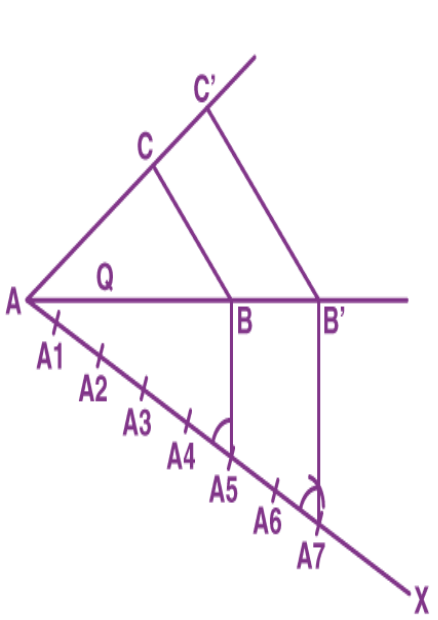
Step 3: These arcs will intersect each other at point C, and therefore ΔABC is the required triangle with the length of sides as 5 cm, 6 cm, and 7 cm respectively.

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.

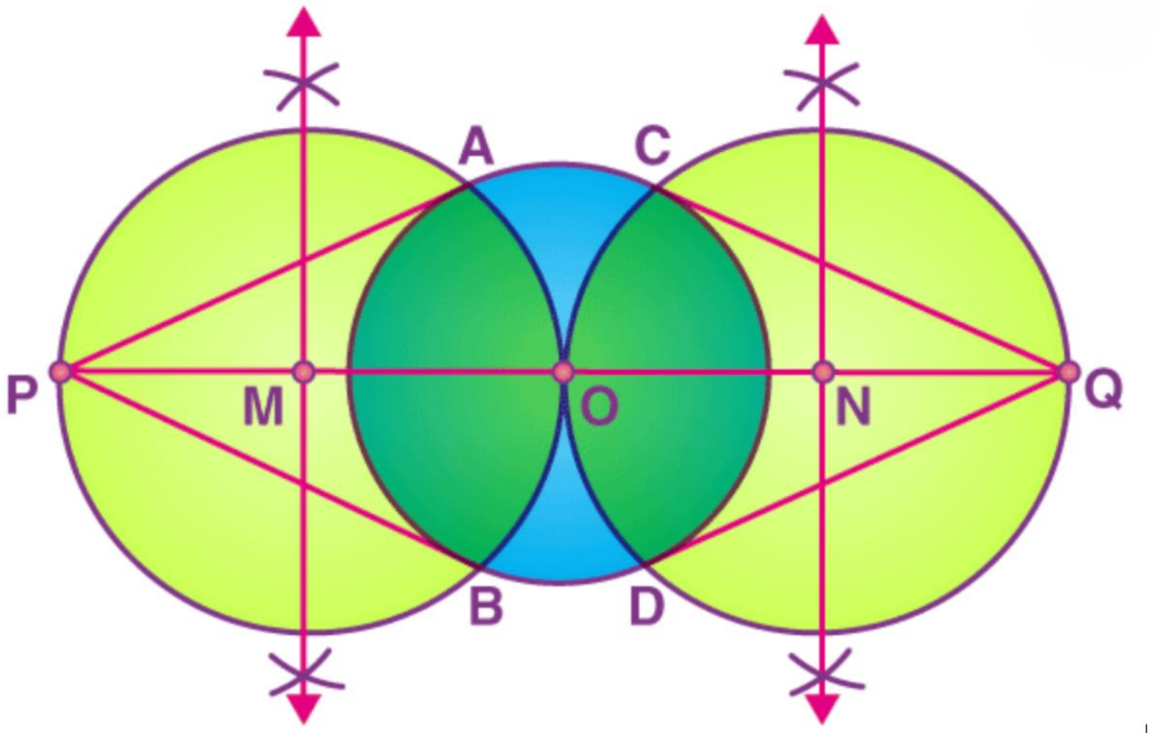
Step 4: Draw a circle with M as centre and MO as the radius

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.

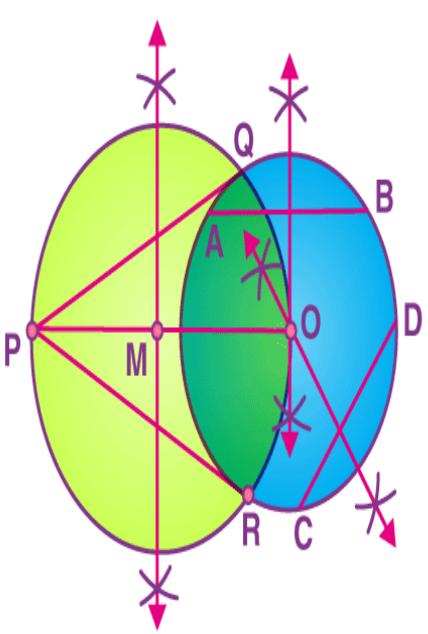
Step 7: Now draw the perpendicular bisector of the line PO and the midpoint is taken as M.

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:

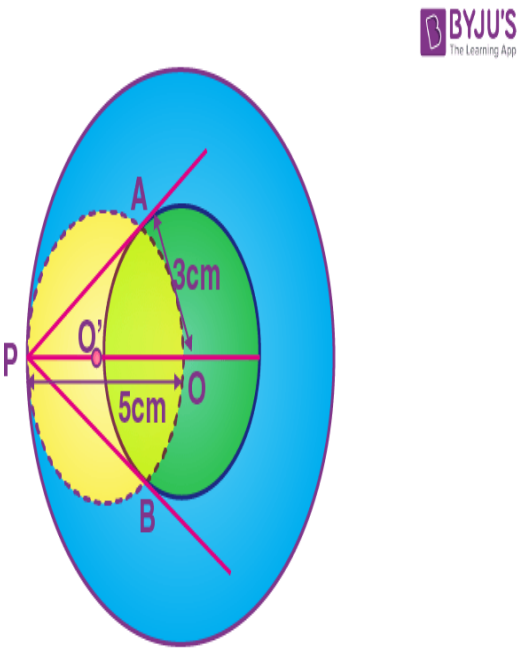
Step 1: Draw a circle with centre O and radius 3 cm.

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:

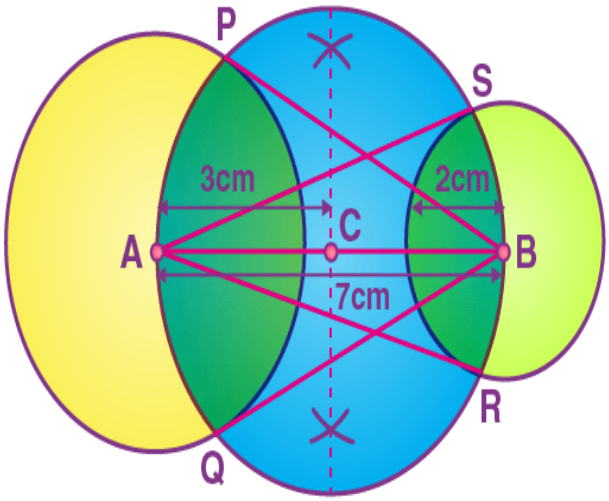
Step 1: Draw a line segment AB of 7 cm.

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.

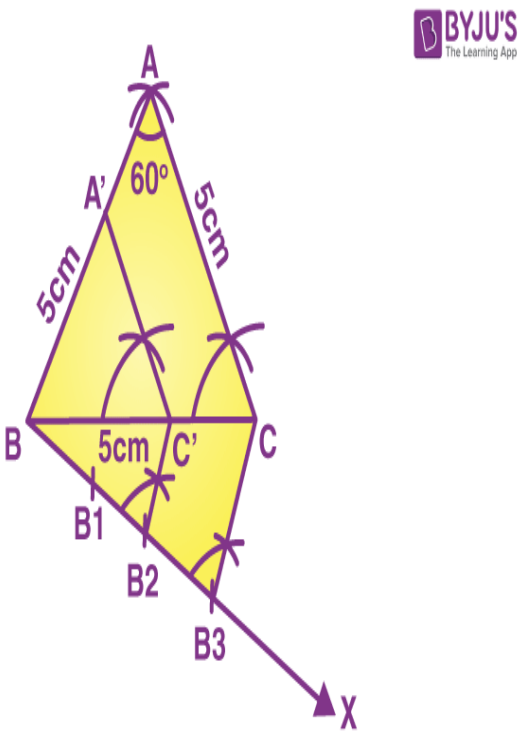
Step 5: Draw a line BX such that ∠CBX is an acute angle and is opposite of vertex A.

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.

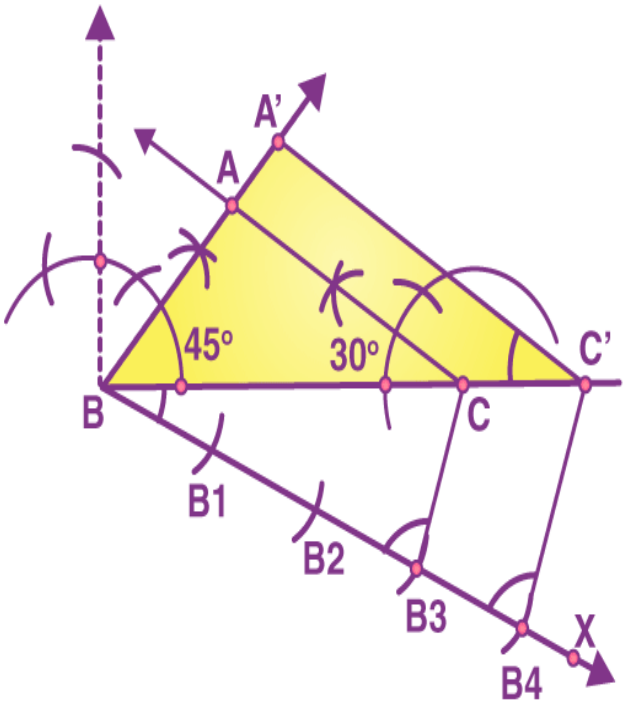
Step 4: Draw a line BX such that ∠CBX is an acute angle and is opposite of vertex A.

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.

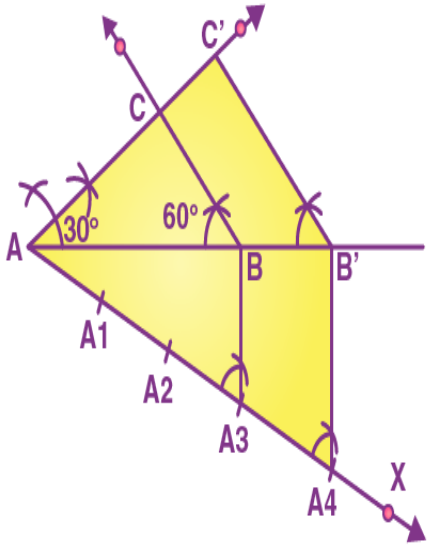
Step 3: Draw a line AX such that ∠BAX is an acute angle and is opposite of vertex C.

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

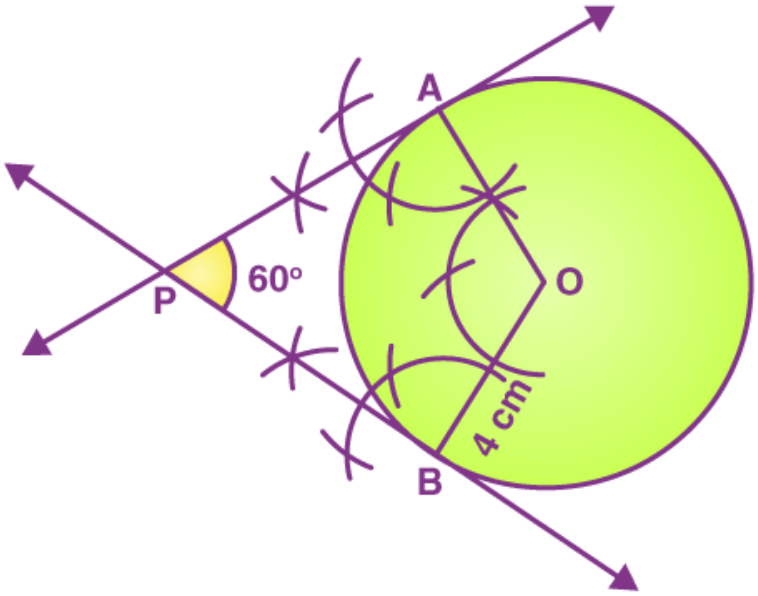
Steps of construction:

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°.


A
O
P
60°
4 cm
B