Constructions

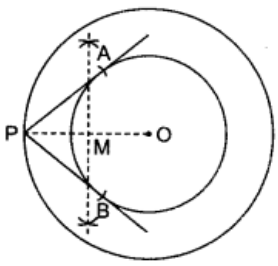
2016

Long Answer Type Questions [4 Marks]

Question 1.

Draw two concentric circles of radii 3 cm and 5 cm. Construct a tangent to smaller circle from a point on the larger circle. Also measure its length

Solution:



Now after measuring, PA and PB comes out to be 4 cm.

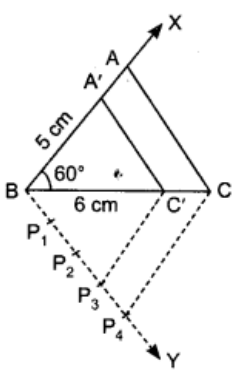
Steps of construction of tangents:

1. Take point O. Draw 2 concentric circles of radii 3 cm and 5 cm respectively.
2. Locate point P on the circumference of larger circle.
3. Join OP and bisect it. Let M be mid-point of OP.
4. Taking M as centre and MP as radius, draw an arc intersecting smaller circle at A and B.
5. Join PA and PB. Thus, PA, PB are required tangents

Question 2.

Construct a triangle ABC in which BC = 6 cm, AB = 5 cm and∠ABC = 60°. Then construct another triangle whose sides are 3/4 times the corresponding sides of ΔABC.

Solution:



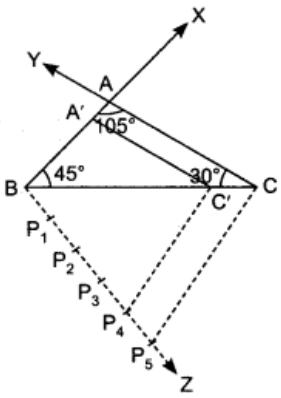
Steps of construction:

1. Draw ΔABC with side BC = 6 cm, AB = 5 cm, ∠ABC = 60°.
2. Draw ray BX making an acute angle with BC on opposite side of vertex A.
3. Locate 4 points P1 P2, P3, P4 on line segment BY.
4. Join P4C and draw a line through P3, parallel to P4C intersecting BC at C'.
5. Draw a line through C' parallel to AC intersecting AB at A'. ΔA'BC' is the required triangle

Question 3.

Draw a triangle ABC with BC = 7 cm, ∠B = 45° and ∠A = 105°. Then construct a triangle whose sides are 4/5 times the corresponding sides of ΔABC.

Solution:



Given, ∠B = 45°,∠A = 105°

Sum of all interior angles in Δ = 180°

∠A +∠B + ∠C = 180°

∠C = 30°

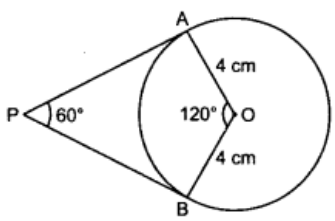
Steps of construction:

1. Draw ΔABC with side BC = 7 cm,∠B = 45°, ∠C = 30°.
2. Draw a ray BX making an acute angle with BC on opposite side of vertex A.
3. Locate 5 points P1, P2, P3, P4, P5 on BZ.
4. Join P5C. Draw line through P4 parallel to P5C intersecting BC at C'.
5. Through C', draw line parallel to AC intersecting AB at A'. ΔA'BC' is the required triangle

Question 4.

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

Solution:



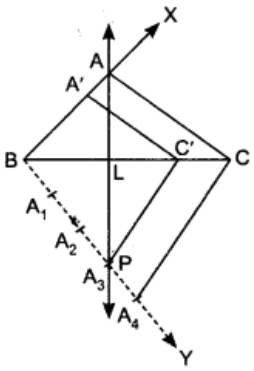
Steps of construction:

1. Draw a circle of radius 4 cm with centre O.
2. Take point A on circle. Join OA.
3- Draw line AP perpendicular to radius OA.
4. Draw ∠AOB = 120° at O.
5. Join A and B at P, to get 2 tangents. Here ∠APB = 60°.

Question 5.

Draw an isosceles ΔABC in which BC = 5.5 cm and altitude AL = 3 cm. Then construct another triangle whose sides are 3/4 of the corresponding sides of ΔABC

Solution:



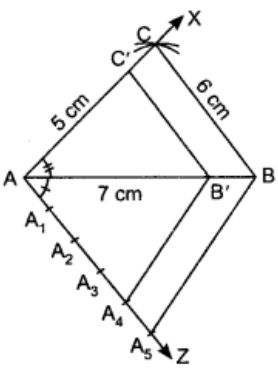
Steps of construction:

1. Draw BC = 5.5 cm.
2. Construct AP the perpendicular bisector of BC meeting BC at L.
3. Along LP cut off LA = 3 cm.
4. Join BA and CA. Then ΔABC so obtained is the required ΔABC.
5. Draw an acute angle CBY and cut 4 equal lengths as BA1 = A1A2 = A2A3 = A3A4 and join CA4.
6. Now draw a line through A3 parallel to CA4 intersecting BC at C'.
7. Draw a line through C' and parallel to AC intersecting AB at A'. BA'C' is the required triangle.

Question 6.

Draw a triangle with sides 5 cm, 6 cm and 7 cm. Then draw another triangle whose 4/5 sides are y of the corresponding sides of first triangle

Solution:

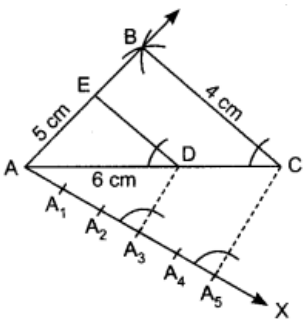


1. Draw a line segment AB of length 7 cm.
   Then using A as centre and distance 5 cm draw an arc C.
   Also draw an arc using B as centre and with distance 6 cm, which intersect earlier drawn arc at C. Join AC and BC.
2. Draw an acute angle BAZ and cut AZ as AA1 = A1A2 = A2A3 = A3A4 = A4A5 and join BA5.
3. Through A4 draw a line parallel BA5 intersecting AB at B'.
4. Through B' draw a line parallel to BC intersecting AC at C'. AB'C' is the required triangle.

Question 7.

Draw a ΔABC in which AB = 4 cm, BC = 5 cm and AC = 6 cm. Then construct another triangle whose sides are 3/5 of the corresponding sides of ΔABC

Solution:



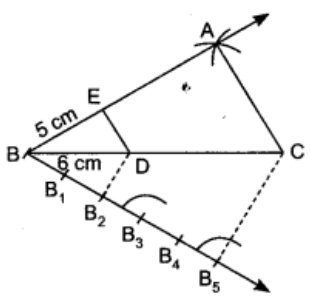
Steps of construction:

1. Draw a line segment AC = 6 cm.
2. Draw an arc with A as centre and radius equal to 5 cm.
3. Draw an arc with C as centre and radius equal to 4 cm intersecting the previous drawn arc at B.
4. Join AB and CB, then ΔABC is required triangle.
5. Below AC make an acute angle CAX.
6. Along AX mark of 5 points A1, A2, A3, A4, A5 such that AA1= A1A2 = A2A3= A3A4 = A4A5.
7. Join A5C.
8. From A3 draw A3D | | A3C meeting AC at D.
9. From D, draw ED | | BC meeting AB at E. Then we have ΔEDA which is the required triangle.

Question 8.

Draw a triangle with sides 4 cm, 5 cm and 6 cm. Then construct another triangle whose sides are 2/5 of the corresponding sides of given (first) triangle

Solution:



Steps of construction:

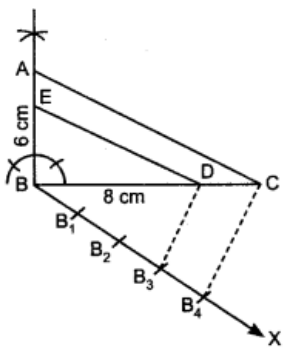
1. Draw a line segment BC = 6 cm.

2. Draw an arc with B as centre and radius equal to 5 cm.
3. Draw an arc with C as centre and radius equal to 4 cm intersecting the previous one at A.
4. Join AB and AC, then ΔABC is the required triangle.
5. Below BC, make an acute angle CBX.
6. Along BX, mark off 5 points B1, B2, B3, B4, B5 such that BB1 = B1B2 = B2B3 = B3B4 = B4B5.
7. Join B5C.
8. From B2, draw B2D ¦ ¦B5C, meeting BC at D.
9. From D, draw ED ¦ ¦ AC, meeting BA at E. Then we have ΔEDB which is the required triangle.

Question 9.

Draw a right triangle in which the sides (other than hypotenuse) are of lengths 8 cm and 6 cm. Then construct another triangle whose sides are 3/4 times the sides of first triangle

Solution:



Steps of construction:

1. Draw line BC = 8 cm then at B draw a line making angle of 90°.
2. Cut a length of 6 cm and name it A. Join AC. ΔABC is the right triangle.
3. Below BC make an acute angle ∠CBX.
4. Along BX mark off 4 points B1, B2, B3, B4 such that BB1=B1B2 = B2B3 = B3B4.
5. Join B4C.
6. From B3 draw B3D ¦ ¦ B4C meeting BC at D.
7. From D draw ED 11 AC meeting BA at E. Now we have ΔEBD which is the required triangle whose sides are 3/4 of the corresponding sides of ΔABC

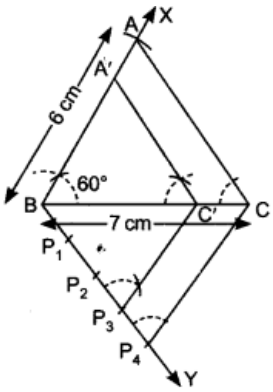
2015

Long Answer Type Questions [4 Marks]

Question 10.

Construct a triangle ABC with BC = 7 cm, ∠B = 60° and AB = 6 cm. Construct another triangle whose sides are 3/4 times the corresponding sides of ΔABC

Solution:



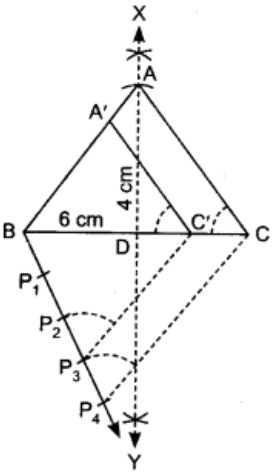
Steps of construction:

1. Draw a line segment BC = 7 cm.
2. Draw ∠B = 60° at point B. Thus∠XBC = 60°
3. Take an arc of 6 cm, with B as centre mark an arc on BX to get point A.
4. Join AC.
5. ΔABC is constructed triangle.
6. Draw an acute angle CBY below BC.
7. Take points P1, P2, P3, P4, at BY such that BP1 = P1P2=P2P3=P3P4
8. Join P4C with line.
9. Draw a line parallel to P4C through the point P3 which intersects BC at C'.
10. Join P3C' with line
11. Draw a line parallel to AC through the point C' which intersects AB at point A'. ΔA'BC' is the required triangle whose sides are 3/4 times the corresponding sides of ΔABC.

Question 11.

Construct an isosceles triangle whose base is 6 cm and altitude 4 cm. Then construct another triangle whose sides are 3/4 times the corresponding sides of the isosceles triangle.

Solution:



Steps of construction:

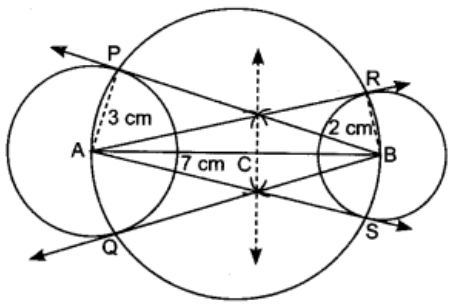
1. Draw a line segment BC = 6 cm.
2. Draw perpendicular bisector of BC which intersects BC at point D.
3. Take an arc of 4 cm, with D as centre mark on arc ⊥ bisector as point A.
4. Join AB and AC. ΔABC is constructed isosceles Δ.
5. Draw an acute angle CBY below BC.
6. Take points P1,P2,P3, P4 at BY such that BP1 = P1P2 = P2P3=P3P4
7. Join P4C with dotted line.
8. Draw a line parallel to P4C through the point P3 which intersects BC at C'.
9. Join P3C' with dotted line.

10. Draw a line parallel to AC through the point C' which intersects AB at A'.
    ΔABC is the required triangle whose sides are 3/4 times the corresponding sides of ΔABC.

Question 12.

Draw a line segment AB of length 7 cm. Taking A as 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:



Required tangents are

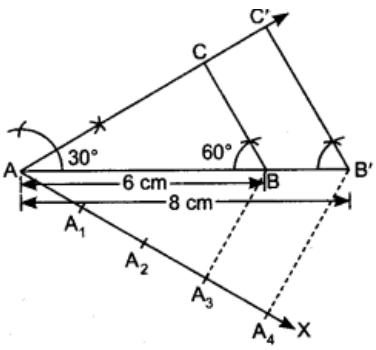
1. BP and BQ
2. AR and AS.
   Steps of construction:

- Draw AB = 7 cm. Taking A and B as centres, draw two circles of 3 cm and 2 cm radius.
- Bisect line AB. Let mid-point of AB be C.
- Taking C as centre, draw circle of AC radius which will intersect circles at P, Q, R, S. Join BP, BQ, AR, AS

Question 13.

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:



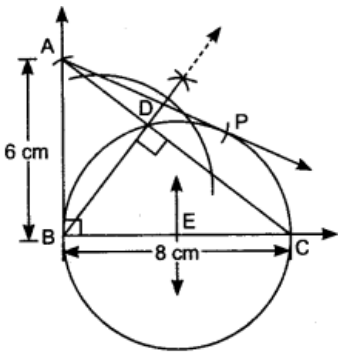
Steps of construction:

1. Draw AB = 6 cm and make an angle of 60° at point B and 30° at point A.
2. Make any acute angle BAX at point A.
3. Cut four arcs A1,A2, A3, A4 on line AX such that AA1=A1A2=A2A3=A3A4
4. Join B to A3.
5. Draw line from A4 parallel to A3B cutting AB extended to B'.
6. Draw line from B' | | BC cuts AC at C'.

Question 14.

Construct a right triangle ABC with AB = 6 cm, BC = 8 cm and ∠B = 90°. Draw BD, the perpendicular from B on AC. Draw the circle through B, C and D and construct the tangents from A to this circle

Solution:



Thus, AP and AB are the required tangents

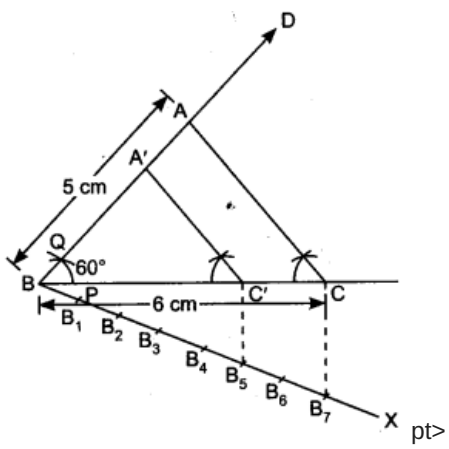
Steps of construction:

1. Draw BC = 8 cm, ∠B = 90°.
2. Take an arc of 6 cm, with B as centre, mark an arc on point A. Join AB.
3. Draw BD ⊥ AC. Bisect line BC at E as mid-point of BC.
4. Taking E as centre and EC as its radius, draw circle which will intersect AC at D. Join BD.
5. Mark point P on circle. Join A to P.

Question 15.

Construct a triangle ABC in which AB = 5 cm, BC = 6 cm and ∠ABC = 60°. Now construct another triangle whose sides are 5/7 times the corresponding sides of ΔABC.

Solution:



pt>

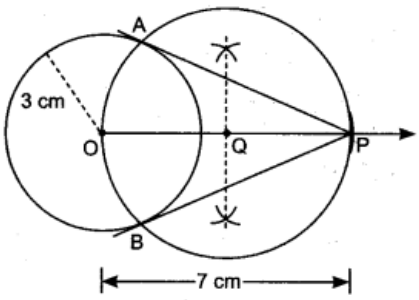
Steps of construction:

1. Draw BC = 6 cm.
2. Take any radius (less than half of BC) and centre B, draw an arc intersecting BC at P. With same radius and centre P, draw another arc intersecting previous arc at Q.
3. Join BQ, extend it to D.
4. Take radius = 5 cm and centre B, we draw arc intersecting BD at A. Join AC, get ΔABC.
5. Draw line BX, as ∠CBX is any acute angle. Draw 7 equal radius arcs on line BX intersecting at B1, B2, B3, B4, B5, B6, B7 as BB1=B1B2=B2B3=B3B4=B4B5=B5B6=B6B7
6. Join B7 to C. Draw line from B5 as parallel to B7C intersecting BC at C'.
7. Draw line from C'as parallel to AC intersecting AB at A'.

Question 16.

Draw a circle of radius 3 cm. From a point P, 7 cm away from its centre draw two tangents to the circle. Measure the length of each tangent.

Solution:



We know, radius perpendicular to tangent with OA = 3 cm, OP = 7 cm

In right ΔOAP, $(OP)^2 = (OA)^2 + (PA)^2$

PB = PA = $2\sqrt{10}$ cm

Steps of construction:

1. Take point O as centre, draw circle of radius 3 cm. Locate point P, 7 cm away from its centre O. Join OP.
2. Bisect OP. Let Q be mid-point of PO.
3. Taking Q as centre and QO as radius, draw a circle.
4. Let this circle intersect previous circle at A and B.
5. Join AP, BP which are required tangents.
   .'. AP = 6.3 cm (approx.)

Question 17.

To a circle of radius 4 cm, draw two tangents which are inclined to each other at an angle of 60°.

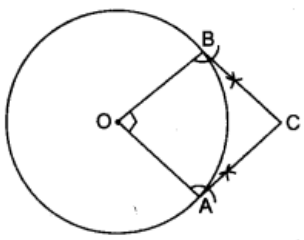
Solution:

Refer to Ans 4.

Question 18.

Draw a circle of radius 3.5 cm. Draw two tangents to the circle which are perpendicular to each other

Solution:



Steps of construction:

1. Draw a circle of radius 3.5 cm with centre O.
2. Take point A on circle. Join OA.
3. Draw perpendicular to OA at A.
4. Draw radius OB, making an angle of 90° with OA.
5. Draw perpendicular to OB at point B. Let these perpendiculars intersect at C.
   Hence, CA and CB are required tangents inclined at angle of 90°.

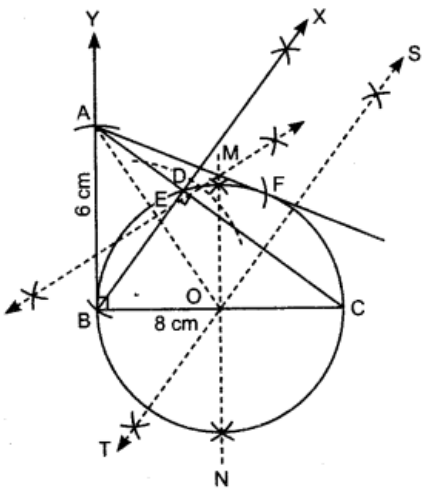
2014

Short Answer Type Questions II [3 Marks]

Question 19.

Draw a right triangle ABC in which AB = 6 cm, BC = 8 cm and ∠B = 90°. Draw BD perpendicular from B on AC and draw a circle passing through the points, B, C and D. Construct tangents from A to this circle

Solution:



AB and AF are the required tangents

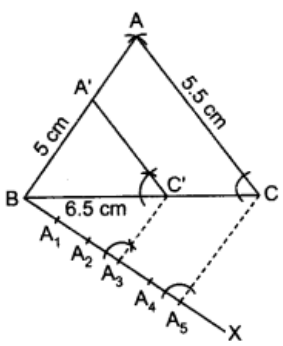
Steps of construction:

1. Draw a right angle triangle ABC, right angled at B. AB = 6 cm and BC = 8 cm.
2. Draw BD ⊥ AC.
3. Draw a circumcircle of ΔBDC.
4. From point A draw pair of tangents AB and AF

Question 20.

Construct a triangle with sides 5 cm, 5.5 cm and 6.5 cm. Now construct another triangle, whose sides are 3/5 times the corresponding sides of the given triangle.

Solution:



Steps of construction:

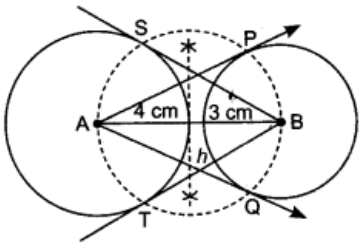
1. A triangle with sides BC = 6.5 cm, AB = 5 cm and AC = 5.5 cm is constructed.
2. ∠CBX is drawn below BC.
3. On BX, A1, A2, A3, A4,…, A5 are marked, such that
   BA1 = A1A2 = A2A3 = A3A4 = A4A5.
4. As and C are joined.
5. C'A3 is drawn parallel to A5C which meets BC at C'.
6. A'C' is drawn parallel to AC meeting AB at A'.
7. ΔA'BC' is the required triangle.

Question 21.

Draw a line segment AB of length 8 cm. Taking A as centre, draw a circle of radius 4 cm and

taking B as centre, draw another circle of radius 3 cm. Construct tangents to each circle from the centre of the other circle

Solution:



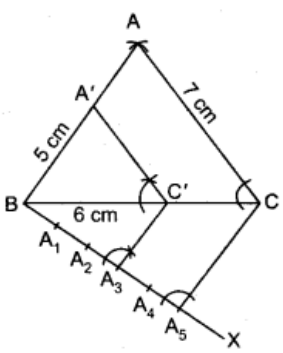
Steps of construction:

1. AB = 8 cm is taken.
2. With centre A, a circle of radius 4 cm is drawn and with centre B, a circle of radius 3 cm is drawn.
3. With AB as diameter, a circle is drawn meeting circle with centre A at S and T respectively arid circle with centre B at P and Q respectively.
4. Then AP and AQ are tangents from A to circle with centre B and BS and BT are tangents from B to circle with centre A.

Question 22.

Construct a triangle ABC, in which AB = 5 cm, BC = 6 cm and AC = 7 cm. Then construct another triangle whose sides are 3/5 times the corresponding sides of ΔABC

Solution:



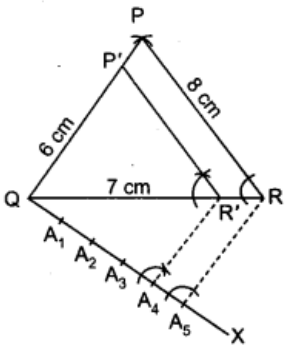
Steps of construction:

1. A triangle ABC with AB =5 cm, BC = 6 cm and AC = 7 cm is constructed.
2. Acute ∠CBX is drawn below BC.
3. On BX, points A1, A2, A3, A4,…, A5 are taken such that BA1 = A1A2 = A2A3 – A3A4 – A4A5.
4. A5 and C are joined.
5. A3C' is drawn parallel to A5C meeting BC at C'.
6. C'A' is drawn parallel to CA meeting BA at A'. The triangle A'BC' is the required triangle.

Question 23.

Construct a triangle PQR, in which PQ = 6 cm, QR = 7 cm and PR = 8 cm. Then construct another triangle whose sides are 4/5 times the corresponding sides of ΔPQR.

Solution:



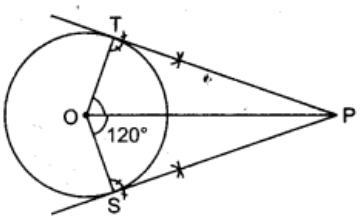
Steps of construction:

1. Triangle PQR with sides PQ = 6 cm QR = 7 cm and PR = 8 cm is constructed.
2. Acute ∠RQX is drawn below QR.
3. On QX, points A1, A2, A3, A4,…, A5 are taken, such that QA1 = A1A2 = A2A3 = A3A4 = A4A5.
4. A5 and R are joined.
5. A4R' is drawn parallel to A5R meeting QR at R'.
6. R'P' is drawn parallel to RP meeting PQ at P'.
   Then ΔP'QR' is the required triangle.

Question 24.

Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of 60°.

Solution:



Steps of construction:

1. A circle, with centre O and radius 5 cm is drawn.
2. As tangents are inclined at 60°,∠ TOS = 120°
3. Two radius OT and OS, inclined at an angle of 120° are drawn.
4. Tangents are drawn to the circle at T and S meeting at P.
   Then PT and PS are the required tangents.

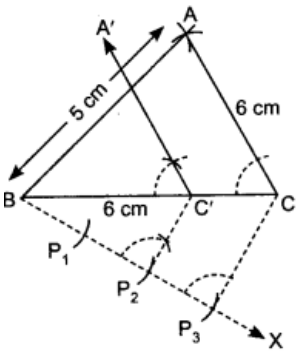
2013

Short Answer Type Questions II [3 Marks]

Question 25.

Construct a triangle with sides 4 cm, 5 cm and 6 cm. Then construct another triangle whose sides are 2/3 times the corresponding sides of first triangle.

Solution:



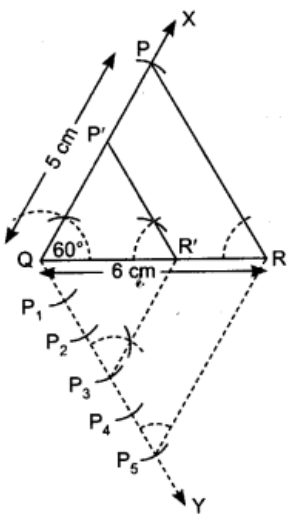
Steps of construction:

1. Draw a line segment BC = 6 cm.
2. With the arc of 5 cm, draw an arc from the point B and with the arc of 4 cm, draw an arc from the point C so that we get point A.
3. Join AB and AC. ΔABC is constructed triangle.
4. Draw an acute angle CBX below BC.
5. Take points P1, P2, P3 at BX such that BP1= P1P2 = P2P3.
6. Join P3C with dotted line.
7. Draw a line parallel to P3C through the point P2 which intersects BC at C'.
8. Join P2C' with dotted line.
9. Draw a line parallel to AC through the point C' which intersects AB at point A'. ΔA'BC' is the required triangle whose sides are 2/3 times the corresponding sides of ΔABC.

Question 26.

Draw a ΔPQR in which QR = 6 cm, PQ = 5 cm and ∠PQR = 60°. Then construct and another triangle whose sides are 3/5 times the corresponding sides of ΔPQR.

Solution:



Steps of construction:

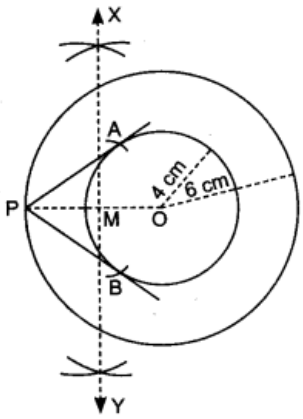
1. Draw a line segment QR = 6 cm.
2. Draw ∠Q = 60° at point Q. Thus, ∠XQR = 60°.
3. Take an arc of 5 cm, with Q as centre mark an arc on QX to get point P.
4. Join PR.
5. ΔPQR is constructed triangle.
6. Draw an acute angle RQY below QR.
7. Take points P1,P2, P3, P4, P5 at QY such that QP1 = P1P2 =P2P3= P3P4 = P4P5

8. Join P5R with dotted line.
9. Draw a line parallel to P5R through the point P3 which intersects QR at R'.
10. Join P3R' with dotted line.
11. Draw a line parallel to PR through the point R' which intersects PQ at point P'.
    ΔP'QR' is the required triangle whose sides are 3/5 times the corresponding sides of ΔPQR.

Question 27.

Construct a tangent to a circle of radius 4 cm from a point on the concentric circle of radius 6 cm.

Solution:



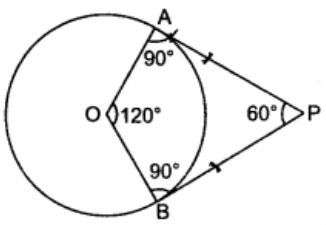
Steps of construction:

1. Draw two concentric circles with centre O of radii 4 cm and 6 cm.
2. Take a point P on the bigger circle of radius 6 cm.
3. Join OP with dotted line.
4. Draw perpendicular bisector of OP which intersects OP at M.
5. With M as centre and MP radius, mark two arcs on smaller circle of radius 4 cm at point A & B.
6. Join PA and PB.
   PA and PB are the required pair of tangents.

Question 28.

Draw a pair of tangents to a circle of radius 4 cm, which are inclined to each other at an angle of 60°.

Solution:



For steps of construction, similar to Ans. 4.

Tangents inclined to each other at angle 60°

∴Radii inclined to each other at angle 120°

Consider O as centre of circle and PA and PB are tangents from point P to circle at A and B.

OA and OB are radii of circle.

∴In quadrilateral OAPB,

∠A +∠B +∠AOB + ∠P = 360°

90° + 90° +∠AOB + 60° = 360°

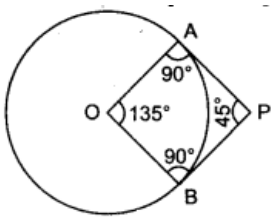
=> ∠AOB = 360° – (240°) = 120°

(as ∠A = ∠B = 90°, Radius is perpendicular to tangent and ∠P = 60° given)
Now, draw pair of tangents to circle as shown

Question 29.

Draw a pair of tangents to a circle of radius 4.5 cm, which are inclined to each other at an angle of 45°.

Solution:

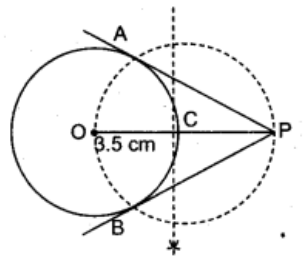


Consider PA and PB are tangents to a circle with centre O, and ∠APB = 45°
OA and OB are radii of circles.
Hence OA ⊥ PA and OB ⊥ PB
∴ ∠OAP = ∠OBP = 90° (radius is perpendicular to tangent)
In quadrilateral OAPB,
∠AOB + ZOAP + ∠OBP + ∠APB = 360° (sum of angles of quadrilateral = 360°)
∠AOB + 90° + 90° + 45° = 360°
∠AOB = 360° – (225°)
∠AOB = 135°
For steps of construction, similar to Ans. 4.

Question 30.

Draw two tangents to a circle of radius 3.5 cm from a point P at a distance of 6.2 cm from its centre.

Solution:

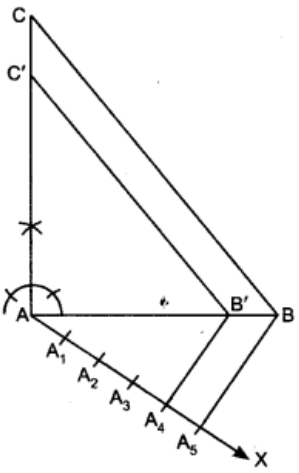


OP = 6.2 cm
PA and PB are tangents to a circle.
For steps of construction, similar to Ans. 16.

Question 31.

Construct a right triangle in which the sides (other than hypotenuse) are of lengths 8 cm and 6 cm. Then construct another triangle whose sides are 3/5 times the corresponding sides of the given triangle

Solution:



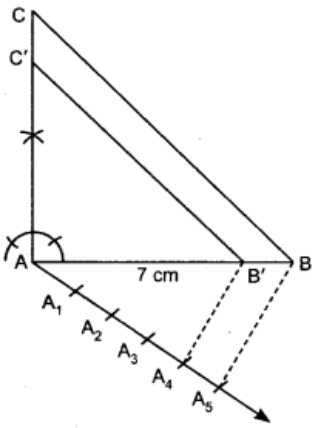
Steps of construction:

1. Draw a line AB = 6 cm.
2. At A, draw a line making angle of 90° and cut a length of 8 cm at point C.
3. Join BC. ΔCAB is right triangle.
4. Draw an acute angle ∠BAX.
5. Make equal parts in AX as AA1 = A1A2 = A2A3 = A3A4= A4A5
6. Join BA5.
7. Now draw line through A3 parallel to A5B intersecting AB at B'.
8. Draw a line through B' parallel to BC intersecting AC at C'. Now, ΔC'AB' is required triangle.

Question 32.

Construct a right triangle in which the sides (other than hypotenuse) are of lengths 5 cm and 7 cm. Then construct another triangle whose sides are 4/5 times the corresponding sides of the given triangle.

Solution:



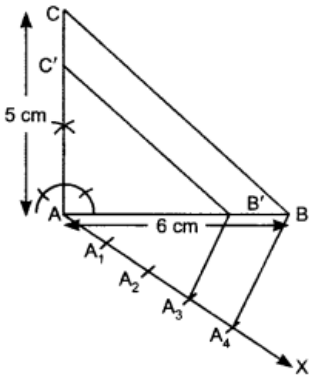
Steps of construction:

1. Draw line AB of length 7 cm.
2. Draw an angle of 90° at A and cut a length of 5 cm at point C. Join BC, ΔABC is the right angled triangle.
3. Draw an acute angle ∠BAX and cut equal lengths as AA1 = A1A2= A2A3 = A3A4=A4A5.
4. Join BA5.
5. Draw a line through A4 and parallel to BA5 intersecting AB at B'.
6. Draw line through B' and parallel to BC intersecting AC at C'.
   ΔC'AB' is the required triangle

Question 33.

Construct a right triangle in which the sides (other than hypotenuse) are of lengths 5 cm and 6 cm. Then construct another triangle whose sides are 3/4 times the corresponding sides of the given triangle.

Solution:



Steps of construction:

1. Draw a line AB of length 6 cm and an angle of 90° at A. Cut a length of 5 cm at C and Join BC, ΔABC is a right triangle.
2. Draw an acute angle ∠BAX and cut equal length as
   AA1= A1 A2 = A2A3 = A3A4.
3. Join A4B and draw a line through A3, parallel to A4B intersecting AB at B'.
4. Now draw a line through B' and parallel to BC intersecting AC at C'.
   ΔAB'C' is the required triangle.

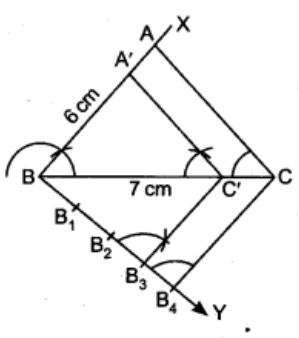
2012

Short Answer Type Questions II [3 Marks]

Question 34.

Draw a triangle ABC with sides BC = 7 cm, ∠ABC = 60° and AB = 6 cm. Then construct another triangle whose sides are 3/4 times the corresponding sides of ΔABC

Solution:



Steps of construction:

1. Draw a line BC = 7 cm
2. Taking B as centre draw an angle ∠XBC = 60°.
3. Taking B as centre cut an arc of 6 cm on BX at A.
4. Join AC. ΔABC is constructed triangle.
5. Draw an acute angle ∠CBY at B.
6. Cut 4 arcs B1,B2, B3, B4 on BY.
   Such that BB1 = B1B2 = B2B3 = B3B4. Join CB4.
7. Draw C'B3 ¦¦CB4.

8. Draw A'C' ¦¦ AC.
9. ΔA'BC' is the required triangle.

Question 35.

Construct a right triangle in which the sides, (other than the hypotenuse) are of lengths 6 cm and 8 cm. Then construct another triangle, whose sides are 3/5 times the corresponding sides of the given triangle.

Solution:

Refer to Ans. 31

Question 36.

Draw a triangle ABC with side BC = 6 cm, ∠C = 30° and ∠A = 105°. Then construct another triangle whose sides are 2/3 times the corresponding sides of ΔABC.

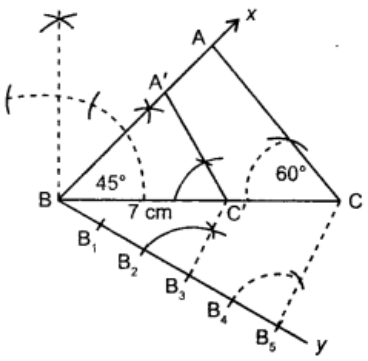
Solution:

Refer to Ans. 3.

Question 37.

Draw a triangle ABC with BC = 7 cm, ∠B = 45° and ∠C = 60°. Then construct another triangle whose sides are 3/5 times the corresponding sides of ΔABC.

Solution:



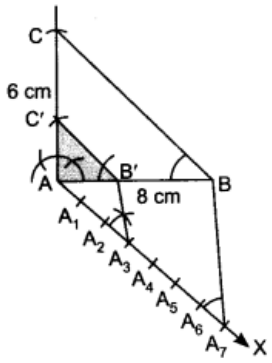
ΔA'BC is the required triangle Steps of construction:

1. Draw a line segment BC = 7 cm.
2. Draw ∠B = 45° at point B. Thus, ∠XBC = 45°.
3. Draw ∠C = 60° at point C which intersects BX at point A.
4. ΔABC is constructed triangle.
5. Draw an acute angle CBY below BC.
6. Take points B1 B2,B3,B4, B5 at BY such that BB1= B1B2 = B2B3 = B3B4 = B4B5.
7. Join B5C.
8. Draw a line parallel to B5C through the point B3 which intersects BC at C.
9. Join B3C'with dotted line.
10. Draw a line parallel to CA through the point C' which intersects AB at point A'. ΔA'BC' is the required triangle similar to ΔABC where each side is 3/5 of the side of ΔABC

Question 38.

Draw a right triangle in which the sides (other than hypotenuse) are of lengths 8 cm and 6 cm. Then construct another triangle whose sides are 3/4 times the corresponding sides of the given triangle.

Solution:



Steps of construction:

1. Draw a triangle CAB with ∠A = 90°, AC = 6 cm,AB = 8 cm.
2. Draw an acute angle BAX
3. Mark 7 arcs A1 to A7 on AX.
4. Draw BA7 ¦¦ B'A3
5. Draw CB ¦¦C'B'
   ΔC'B'A is the required triangle.

Question 39.

Draw a triangle with sides 5 cm, 6 cm 7 cm. Then construct another triangle whose sides are 2/3 times the corresponding sides of the first triangle

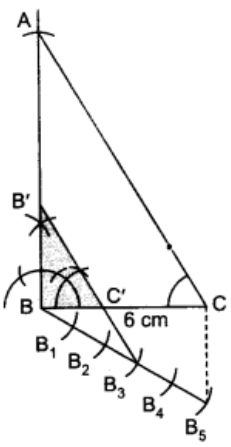
Solution:

Similar to Ans. 6.

Question 40.

Draw a right triangle in which the sides (other than the hypotenuse) are of lengths 6 cm and 8 cm. Then construct another triangle whose sides are 3/5 times the corresponding sides of the given triangle.

Solution:



For steps of construction, similar to Ans. 31.

Question 41.

Draw a triangle ABC with side AC = 7 cm, ∠A = 45° and ∠B = 105°. Then construct a triangle whose sides are 3/4 times the corresponding sides of ΔABC

Solution:

Similar to Ans. 3.

Question 42.

Draw a triangle with sides 5 cm, 6 cm and 7 cm. Then draw a triangle whose sides are , 2/3 times the corresponding sides of the first triangle

Solution:

Similar to Ans. 6

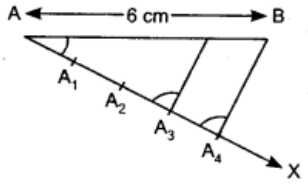
2011

Short Answer Type Questions I [2 Marks]

Question 43.

Draw a line segment of length 6 cm. Using compasses and ruler, find a point P on it which divides it in the ratio 3 : 4.

Solution:



Let AB = 6 cm. Take a point 'P' on it which divides it in the 3:4,Hence,

3x+4x=6

7x=6

x=6/7

3x=3 x 0.857=2.571

Hence P will be the distancef 2.571 from point A of segment AB

Question 44.

Draw a line segment AB of length 7 cm. Using ruler and compasses, find a point P on AB such that AP/AB=3/5

Solution:

Similar to Ans. 43.

Question 45.

Draw a line segment of length 7.6 cm and divide it in the ratio 3 :2

Solution:

Similar to Ans. 43.

Question 46.

Draw a line segment AB of length 6.5 cm. Find a point P on it such that AP/AB=3/5

Solution:

Similar to Ans. 43.

Question 47.

Draw a triangle ABC, in which AB = 5 cm, BC = 6 cm and ∠ABC = 60°. Then construct a triangle whose sides are 5/7 times the corresponding sides of ΔABC.

Solution:

Refer to Ans. 15.

Short Answer Type Questions II [3 Marks]

Question 48.

Draw a triangle ABC with side BC = 7 cm, ∠B = 45° and ∠A = 105° .Then construct a triangle whose sides are 3/5 times the corresponding sides of ΔABC

Solution:

Similar to Ans. 3.

Question 49.

Draw a pair of tangents to a circle of radius 3 cm, which are inclined to each other at an angle of 60°.

Solution:

Similar to Ans. 4.

Question 50.

Draw a right triangle in which the sides (other than hypotenuse) are of lengths 4 cm and 3 cm. Then construct another triangle whose sides are 3/5 times the corresponding sides of the given triangle

Solution:

Similar to Ans. 9.

Question 51.

Draw a line segment AB of length 7 cm. Taking A as 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.

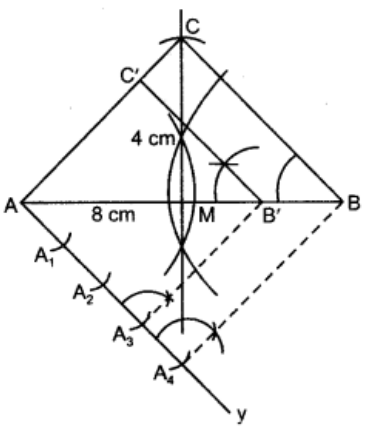
Solution:

Refer to Ans. 12.

Question 52.

Construct an isosceles triangle whose base is 8 cm and altitude 4 cm and then construct another triangle whose sides are times 3/4 the corresponding sides of the isosceles triangle.

Solution:



ΔC'AB' is the required triangle whose sides are 3/4 times the corresponding sides of the isosceles triangle.

Steps of construction:

1. Draw line segment AB = 8 cm
2. Draw perpendicular bisector of AB which intersects AB at point M.
3. Take an arc of 4 cm, with M as centre mark an arc on the perpendicular bisector as point C.
4. Join AC and BC. ΔCAB is the isosceles Δ.
5. Draw an acute angle BAY below AB.
6. Take point A1, A2, A3, A4 at AY such that AA1 = A1A2 = A2A3 = A3A4
7. Join A4B with dotted line.
8. Draw a line parallel to A4B through the point A3 which intersects AB at B'.
9. Join A3B' with dotted line.
10. Draw a line parallel to BC through the point B' which intersects AC at point C'. ΔC'AB' is the required triangle similar to ΔCAB where each side is 3/4 of the side of ΔCAB.

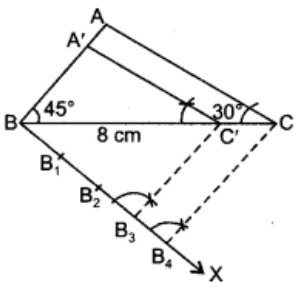
2010

Short Answer Type Questions II [3 Marks]

Question 53.

Construct a triangle ABC in which BC = 8 cm, ∠B = 45° and ∠C = 30°. Construct another triangle similar to ΔABC such that its sides are 3/4 of the corresponding sides of ΔABC

Solution:



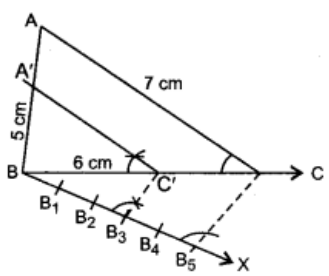
Steps of construction:

1. Draw a line segment BC = 8 cm.
2. Then construct ∠B = 45° at B.
3. Then construct ∠C = 30° at C.
4. Line segments from the angles B and C, when produced, meet at A.
5. ΔABC is the constructed triangle.
6. Draw an acute angle CBX below BC.
7. Take points B1, B2, B3, B4 at BX, such that BB1 = B1B2 = B2B3 = B3B4.
8. Join B4C.
9. Draw B3C' parallel to B4C meeting BC at C'.
10. Draw C'A' parallel to CA, meeting BA at A'.
    ΔA'BC' is the required triangle similar to ΔABC where each side is 3/4 of the side of ΔABC.

Question 54.

Construct a triangle ABC in which AB =5 cm, BC = 6 cm and AC = 7 cm. Construct another triangle similar to ΔABC such that its sides are 3/5 of the corresponding sides of ΔABC.

Solution:



Steps of construction:

1. A line segment BC = 6 cm is drawn.
2. An arc is drawn from B of radius 5 cm.
3. An arc is drawn from C of radius 7 cm, cutting the . first arc at A.
4. AB and AC are joined to get ΔABC.
5. An acute angle CBX is drawn below BC.
6. On BX, points B1, B2, B3, B4, B5 are taken such that BB1= B1B2 = B2B3 – B3B4 = B4B5.

7. B5 and C are joined.
8. B3C' is drawn parallel to B5C meeting BC at C'.
9. C'A' is drawn parallel to CA, meeting BA at A'.
10. Then ΔA'BC' is the required triangle similar to ΔABC, where sides are 3/5 of the Corresponding sides of ΔABC.

Question 55.

Construct a triangle PQR in which QR = 6 cm, ∠Q = 60° and ∠R = 45°. Construct another triangle similar to ΔPQR such that its sides are 5/6 of the corresponding sides of ΔPQR.

Solution:

Similar to Ans. 37.

Question 56.

Construct a triangle ABC in which AB=8cm BC = 10 cm, AC= 6cm construct another triangle whose sides are 4/5 of the corresponding sides of ΔABC

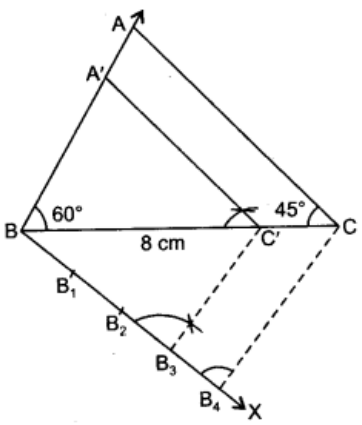
Solution:

Similar to Ans.7.

Question 57.

Construct a triangle ABC in which BC = 8 cm, ∠B = 60° and ∠C = 45°. Then construct another triangle whose sides are of the corresponding sides of ΔABC

Solution:



Steps of construction:

1. A line segment BC = 8 cm is drawn.
2. At B draw an angle 60°.
3. At C draw an angle 45°.
4. The arms of angle 60° and 45° intersect at A. Now, AB and AC are drawn to get the triangle ABC.
5. An acute angle CBX is drawn below BC.
6. Points B1, B2, B3, B4 are taken at BX, such that BB1 = B1B2 = B2B3 = B3B4.
7. B4 and C are joined.
8. B3C' is drawn parallel to B4C meeting BC at C'.
9. C'A' is drawn parallel to CA meeting BA at A'.
10. Then ΔA'BC' is the required triangle similar to ΔABC whose sides are of the corresponding sides of ΔABC.

Question 58.

Construct a triangle ABC in which BC = 9 cm, ∠B = 60° and AB = 6 cm. Then construct another triangle whose sides are 2/3 of the corresponding sides of ΔABC

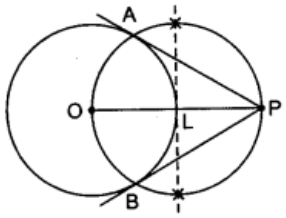
Solution:

Similar to Ans. 15

Question 59.

Draw a circle of radius 4 cm. From a point P, 9 cm away from the centre of the circle, draw two tangents to the circle. Also, measure the lengths of the tangents.

Solution:



Steps of construction:

1. A circle, with centre O and radius 4 cm is drawn.
2. A point P is taken, outside the circle at a distance of 9 cm from O.
3. Perpendicular bisector of OP is drawn, meeting OP at L.
4. With L as centre and OL as radius a circle is drawn meeting the given circle at A and B.
5. PA and PB are joined.
6. Then PA and PB are the required tangents to the circle and PA = PB = 6.7 cm (approx.)

Question 60.

Draw a circle of radius 3 cm. From a point P, 7 cm away from the centre of the circle, draw two tangents to the circle. Also, measure the lengths of the tangents

Solution:

Refer to Ans. 16.

Question 61.

Draw a circle of radius 3 cm. From a point 5 cm away from the centre of the circle, draw two tangents to the circle. Also, measure the lengths of the tangents.

Solution:

Similar to Ans. 16.