RS Aggarwal Solutions for Class 10 Maths Chapter 9–Constructions

Class 10 -
Chapter 9
Constructions

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RS Aggarwal Solutions for Class 10 Maths Chapter 9−Constructions

Class 10: Maths Chapter 9 solutions. Complete Class 10 Maths Chapter 9 Notes.

RS Aggarwal Solutions for Class 10 Maths Chapter 9–Constructions

RS Aggarwal 10th Maths Chapter 9, Class 10 Maths Chapter 9 solutions

Page No 522:

Question 1:

Draw a line segment AB of length 7 cm. Using ruler and compasses, find a point P on AB such that APAB=35.   [CBSE 2011]

Answer:

Steps of Construction:

Step 1. Draw a line segment AB = 7 cm.
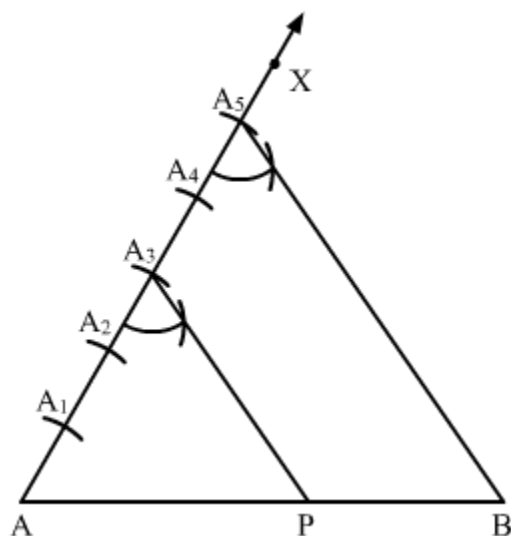
Step 2. Draw a ray AX, making an acute angle ∠BAX.

Step 3. Along AX, mark 5 points (greater of 3 and 5) A_1, A_2, A_3, A_4 and A_5 such that

$AA_1 = A_1A_2 = A_2A_3 = A_3A_4 = A_4A_5$

Step 4. Join A_5B.

Step 5. From A_3, draw A_3P parallel to A_5B (draw an angle equal to $\angle AA_5B$), meeting AB in P.

Here, P is the point on AB such that APPB=32 or APAB=35.

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Question 2:

(i) Draw a line segment of length 8 cm and divide it internally in the ratio 4 : 5.   [CBSE 2017]

(ii) Draw a line segment of length 7.6 cm and divide it in the ratio 5 : 8. Measure the two parts.

Answer:

(i) **Steps of Construction:**

https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-10-maths-chapter-9-constructions/
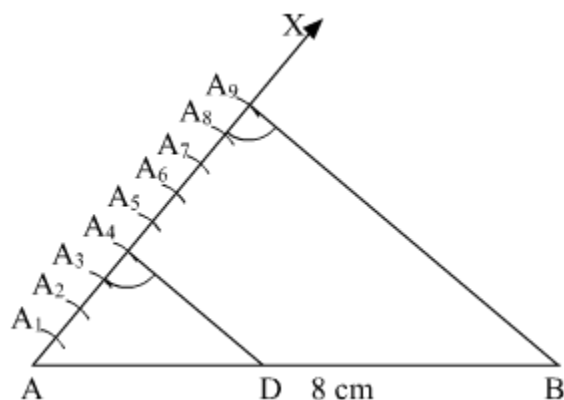
Step 1. Draw a line segment AB = 8 cm

Step 2. Draw a ray AX, making an acute angle ∠BAX.

Step 3. Along AX, mark (4 + 5 =) 9 points A_1, A_2, A_3, A_4, A_5, A_6, A_7, A_8 and A9 such that

$AA_1 = A_1A_2 = A_2A_3 = A_3A_4 = A_4A_5 = A_5A_6 = A_6A_7 = A_7A_8 = A_8A_9$

Step 4. Join A_9B.

Step 5. From A_4, draw A_4D parallel to A_9B (draw an angle equal to ∠AA_9B), meeting AB in D.

Here, D is the point on AB which divides it in the ratio 4 : 5.

(ii) **Steps of Construction:**

Step 1. Draw a line segment AB = 7.6 cm

Step 2. Draw a ray AX, making an acute angle $\angle BAX$.

Step 3. Along AX, mark (5 + 8 =) 13 points A_1, A_2, A_3, A_4, A_5, A_6, A_7, A_8, A_9, A_{10}, A_{11}, A_{12} and A_{13} such that

$AA_1 = A_1A_2 = A_2A_3 = A_3A_4 = A_4A_5 = A_5A_6 = A_6A_7 = A_7A_8 = A_8A_9 = A_9A_{10} = A_{10}A_{11} = A_{11}A_{12} = A_{12}A_{13}$

Step 4. Join $A_{13}B$.

Step 5. From A_5, draw A_5P parallel to $A_{13}B$ (draw an angle equal to $\angle AA_{13}B$), meeting AB in P.

Here, P is the point on AB which divides it in the ratio 5 : 8.

∴ Length of AP = 2.9 cm (Approx)

Length of BP = 4.7 cm (Approx)

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Question 3:

Construct a ∆PQR, in which PQ = 6 cm, QR = 7 cm and PR = 8 cm. Then, construct another triangle whose sides are 45 times the corresponding sides of ∆PQR.
        [CBSE 2013, 14]

Answer:

Steps of Construction

Step 1. Draw a line segment QR = 7 cm.

Step 2. With Q as centre and radius 6 cm, draw an arc.

Step 3. With R as centre and radius 8 cm, draw an arc cutting the previous arc at P.

Step 4. Join PQ and PR. Thus, ∆PQR is the required triangle.
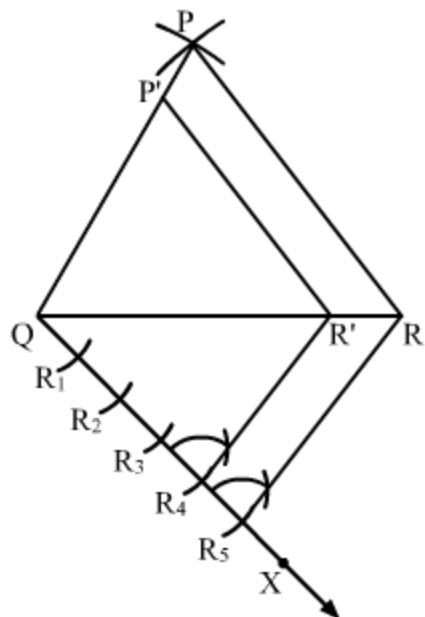
Step 5. Below QR, draw an acute angle ∠RQX.

Step 6. Along QX, mark five points R_1, R_2, R_3, R_4 and R_5 such that $QR_1 = R_1R_2 = R_2R_3 = R_3R_4 = R_4R_5$.

Step 7. Join RR_5.

Step 8. From R_4, draw $R_4R' \parallel RR_5$ meeting QR at R'.

Step 9. From R', draw P'R' || PR meeting PQ in P'.

Here, ∆P'QR' is the required triangle, each of whose sides are 45 times the corresponding sides of ∆PQR.

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Question 4:

Construct a triangle with sides 5 cm, 6 cm and 7 cm and then another triangle whose sides are 75 of the corresponding sides of first triangle.

Answer:

Steps of Construction :

Step 1. Draw a line segment BC = 4 cm.

Step 2. With B as centre, draw an angle of 90º.

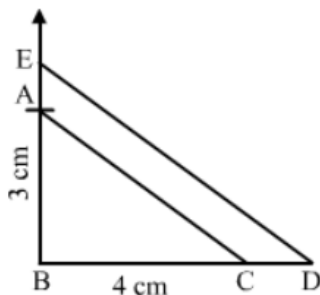Step 3. With B as centre and radius equal to 3 cm, cut an arc at the right angle and name it A.

Step 4. Join AB and AC.

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Thus, △ ABC is obtained .

Step 5. Extend BC to D, such that BD = 75 BC =   75 (4) cm = 5.6 cm.

Step 6. Draw DE ∥ CA, cutting AB produced to E.

Thus, △EBD is the required triangle, each of whose sides is 75 the corresponding sides of △*ABC*.

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Question 5:

Construct a Δ*ABC* with *BC* = 6 cm, ∠*B* = 60° and *AB* = 5 cm. Construct another triangle whose sides are 34 times the corresponding sides of Δ*ABC*.

Answer:

Given: In Δ*ABC*,

BC = 6 cm,

∠*B* = 60°

AB = 5 cm

Steps of construction:

(1) Draw a line segment *AB* = 5 cm.

(2) From the point *B*, draw an ∠*ABY* = 60°

(3) Taking *B* as center, 6 cm radius, draw an arc on the ray *BY*,

   Let the point where the arc intersects the ray named as *C*.

(4) Join *AC*.
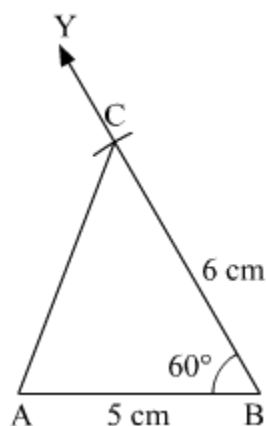
Hence, Δ*ABC* is the required triangle.

Now, we construct another triangle whose sides are 34 times the corresponding sides of Δ*ABC*.

Steps of construction:

(1) Draw any ray *BX* making an acute angle with *BA* on the side opposite to the vertex *C*.

(2) Mark four points B_1, B_2, B_3 and B_4 on *BX*, so that $BB_1 = B_1B_2 = B_2B_3 = B_3B_4$.

(3) Join B_4A and draw a line through B_3 parallel to B_4A to intersect *AB* at *A'*.

(4) Draw a line through *A'* parallel to *AC* to intersect *BC* at *C'*.
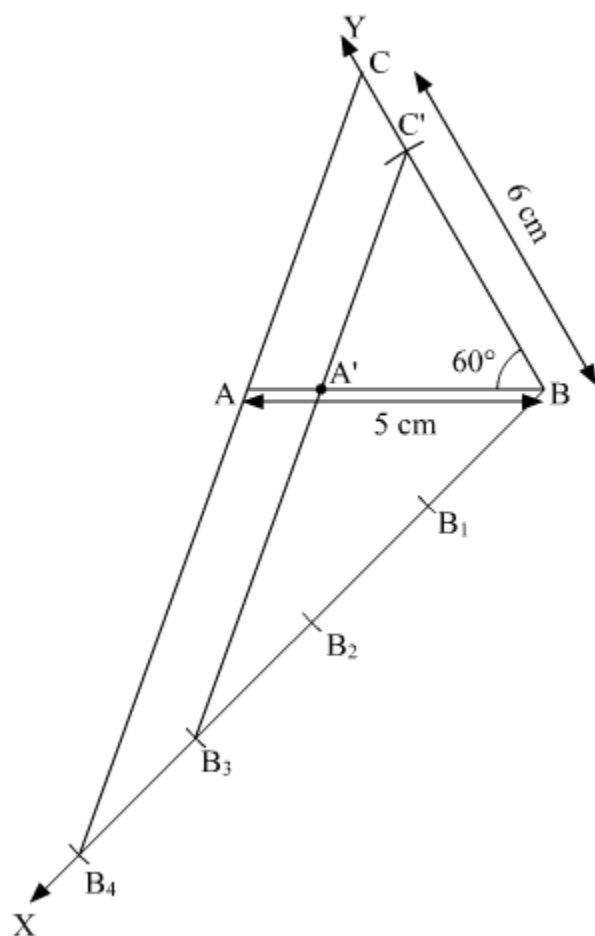
Hence, ∆*A'BC'* is the required triangle.

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Question 6:

Construct a ∆ABC in which AB = 6 cm, ∠A = 30º and ∠B = 60º. Construct another ∆AB'C' similar to ∆ABC with base

AB' = 8 cm.
        [CBSE 2015]

Answer:

Steps of Construction

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

Step 2. At A, draw ∠XAB = 30º.

Step 3. At B, draw ∠YBA = 60º. Suppose AX and BY intersect at C.

Thus, ΔABC is the required triangle.

Step 4. Produce AB to B' such that AB' = 8 cm.

Step 5. From B', draw B'C' || BC meeting AX at C'.
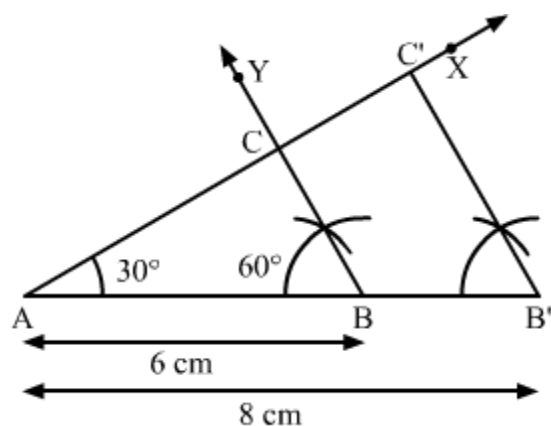
Here, ∆AB'C' is the required triangle similar to ∆ABC.

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Question 7:

Construct a ∆ABC in which BC = 8 cm, ∠B = 45º and ∠C = 60º. Construct another triangle similar to ∆ABC such that its sides are 35 of the corresponding sides of ∆ABC.
        [CBSE 2010, '12, '14]

Answer:

Steps of Construction

Step 1. Draw a line segment BC = 8 cm.

Step 2. At B, draw ∠XBC = 45º.

Step 3. At C, draw ∠YCB = 60º. Suppose BX and CY intersect at A.

Thus, ∆ABC is the required triangle.

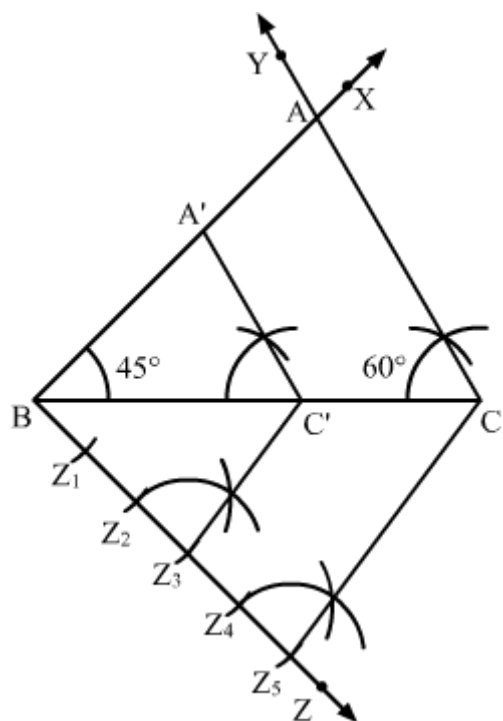**Step 4**. Below BC, draw an acute angle ∠ZBC.

Step 5. Along BZ, mark five points Z_1, Z_2, Z_3, Z_4 and Z_5 such that $BZ_1 = Z_1Z_2 = Z_2Z_3 = Z_3Z_4 = Z_4Z_5$.

Step 6. Join CZ_5.

Step 7. From Z_3, draw Z_3C' || CZ_5 meeting BC at C'.
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Step 8. From C', draw A'C' || AC meeting AB in A'.

Here, ∆A'BC' is the required triangle whose sides are 35 of the corresponding sides of ∆ABC.

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Question 8:

To construct a triangle similar to ∆ABC in which BC = 4.5 cm, ∠B = 45º and ∠C = 60º, using a scale factor of 37, BC will be divided in the ratio

(a) 3 : 4   (b) 4 : 7   (c) 3 : 10   (d) 3 : 7
[CBSE 2012]

Answer:

To construct a triangle similar to ∆ABC in which BC = 4.5 cm, ∠B = 45º and ∠C = 60º, using a scale factor of 37, BC will be divided in the ratio 3 : 4.
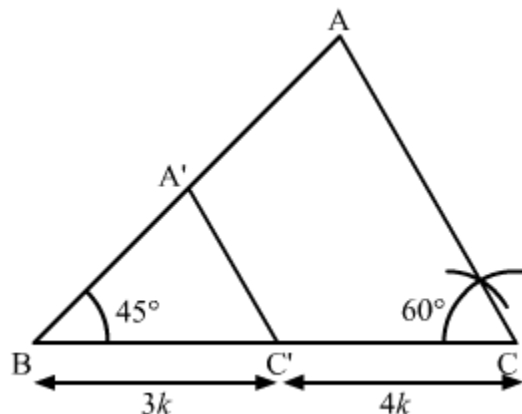
Here, ∆ABC ~ ∆A'BC'

BC' : C'C = 3 : 4

or BC' : BC = 3 : 7

Hence, the correct answer is option A.

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Question 9:

Construct an isosceles triangle whose base is 8 cm and altitude 4 cm and then another triangle whose sides are 112 times the corresponding sides of the isosceles triangle.

Answer:

Steps of Construction

https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-10-maths-chapter-9-constructions/
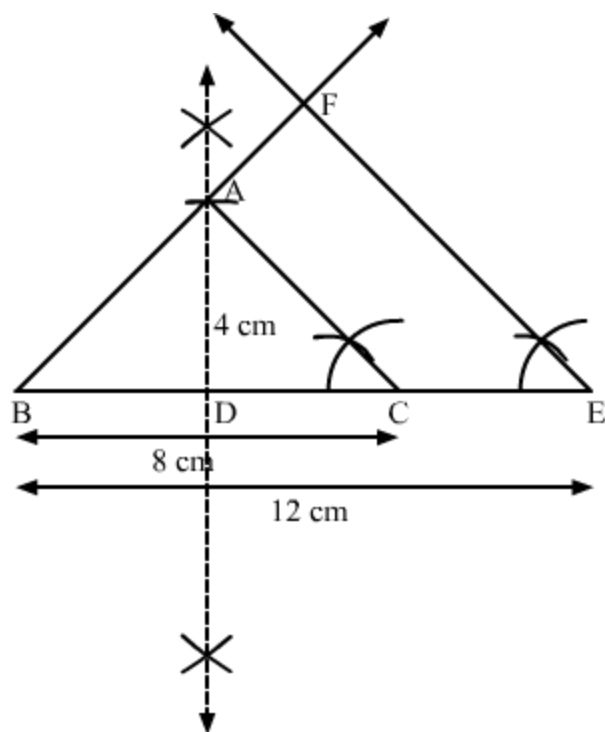
Step 1. Draw a line segment BC = 8 cm.

Step 2. Draw the perpendicular bisector XY of BC, cutting BC at D.

Step 3. With D as centre and radius 4 cm, draw an arc cutting XY at A.

Step 4. Join AB and AC. Thus, an isosceles ∆ABC whose base is 8 cm and altitude 4 cm is obtained.

Step 5. Extend BC to E such that BE = 32BC = 32×8 cm = 12 cm.

Step 6. Draw EF || CA, cutting BA produced in F.

Here, ∆BEF is the required triangle similar to ∆ABC such that each side of ∆BEF is 112 or 32 times the corresponding side of ∆ABC.

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Question 10:

Draw a right triangle in which sides (other than hypotenuse) are of lengths 4 cm and 3 cm. Then, construct another triangle whose sides are 53 times the corresponding sides of the given triangle.   [CBSE 2011]

Answer:

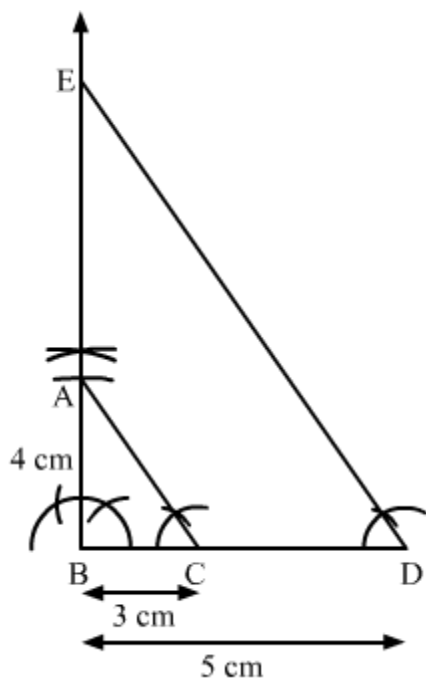**Steps of Construction**

Step 1. Draw a line segment BC = 3 cm.

Step 2. At B, draw ∠XBC = 90º.

Step 3. With B as centre and radius 4 cm, draw an arc cutting BX at A.

Step 4. Join AC. Thus, a right ∆ABC is obtained.

Step 5. Extend BC to D such that BD = 53BC = 53×3 cm = 5 cm.

Step 6. Draw DE || CA, cutting BX in E.

Here, ∆BDE is the required triangle similar to ∆ABC such that each side of ∆BDE is 53 times the corresponding side of ∆ABC.

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Question 1:

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.
        [CBSE 2010]

Answer:

Steps of Construction

Step 1. Draw a circle with O as centre and radius 3 cm.
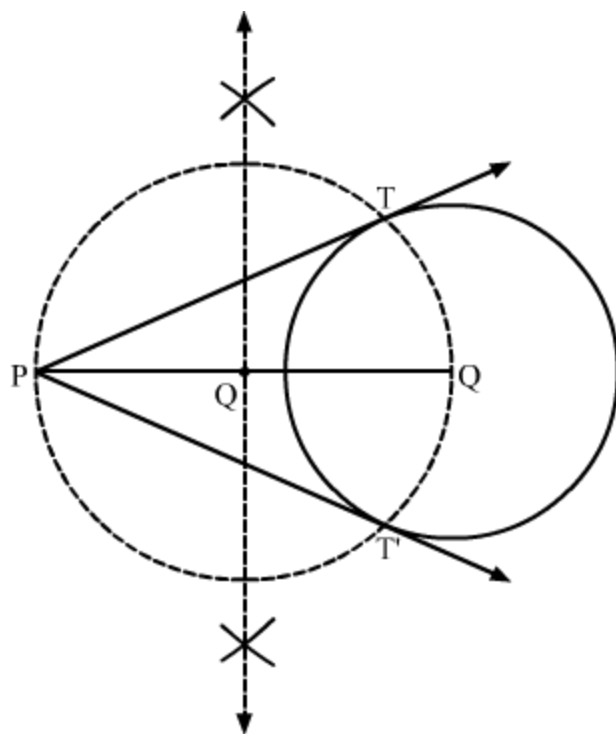
Step 2. Mark a point P outside the circle such that OP = 7 cm.

Step 3. Join OP. Draw the perpendicular bisector XY of OP, cutting OP at Q.

Step 4. Draw a circle with Q as centre and radius PQ (or OQ), to intersect the given circle at the points T and T'.

Step 5. Join PT and PT'.

Here, PT and PT' are the required tangents.

PT = PT' = 6.3 cm (Approx)

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Question 2:

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.

Answer:

Steps of Construction

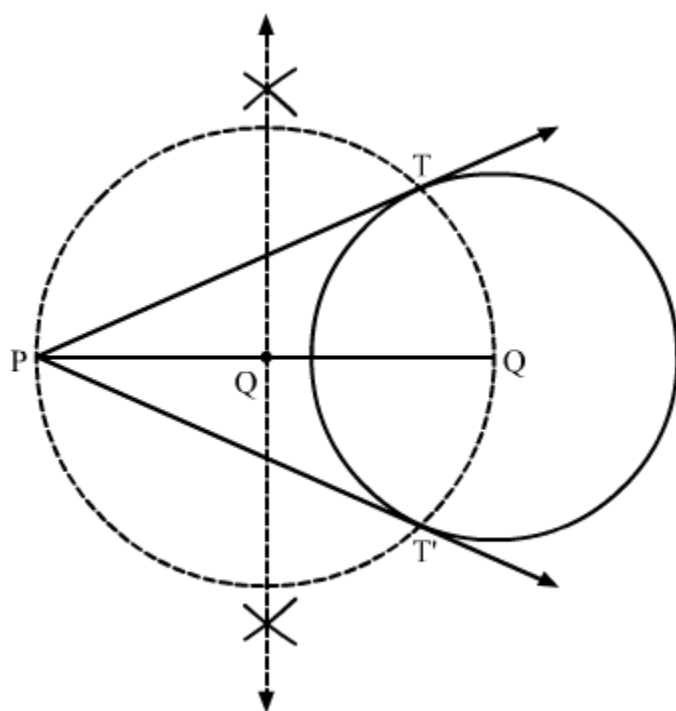**Step 1**. Draw a circle with O as centre and radius 3.5 cm.

Step 2. Mark a point P outside the circle such that OP = 6.2 cm.

Step 3. Join OP. Draw the perpendicular bisector XY of OP, cutting OP at Q.

Step 4. Draw a circle with Q as centre and radius PQ (or OQ), to intersect the given circle at the points T and T'.

Step 5. Join PT and PT'.

Here, PT and PT' are the required tangents.

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Question 3:

Draw a circle of radius 3 cm. Take two points *P* and *Q* on one of its diameters extended on both sides, each at a distance of 7 cm on opposite sides of its centre. Draw tangents to the circle from these two points *P* and *Q*.   [CBSE 2017]

Answer:

Steps of Construction

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

Step 2. Mark a point P and Q on one of its diameters extended on both sides outside the circle such that OP = OQ = 7 cm.

Step 3. Join OP and OQ. Draw the perpendicular bisector XY of OP and X'Y' of OQ, cutting OP at L and OQ at M.

Step 4. Draw a circle with L as centre and radius PL (or OL), to intersect the given circle at the points A and B. Draw another circle with M as centre and radius MQ (or OM), to intersect the given circle at the points C and D.

Step 5. Join PA and PB. Join QC and QD.
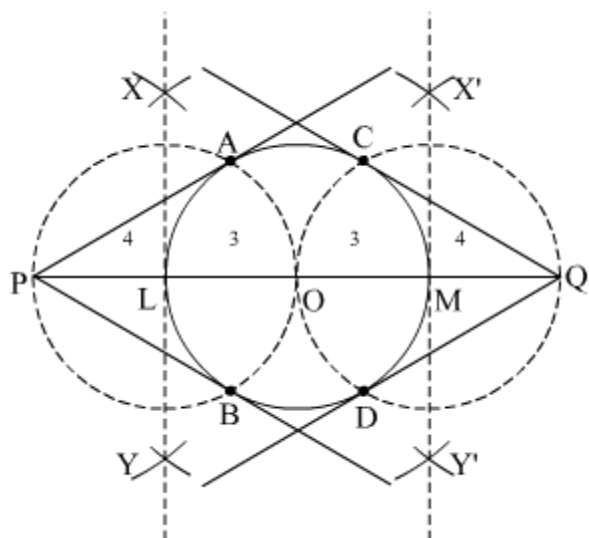
Here, PA, PB and QC, QD are the required tangents.

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Question 4:

Draw a circle with centre O and radius 4 cm. Draw any diameter AB of this circle. Construct tangents to the circle at each of the two end points of the diameter AB.
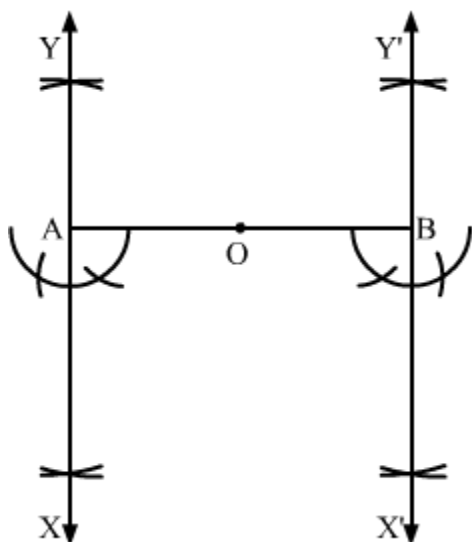
Answer:

Steps of Construction

Step 1. Draw a circle with centre O and radius 4 cm.

Step 2. Draw any diameter AOB of the circle.

Step 3. At A, draw ∠OAX = 90°. Produce XA to Y.

Step 4. At B, draw ∠OBX' = 90º. Produce X'B to Y'.

Here, XAY and X'BY' are the tangents to the circle at the end points of the diameter AB.

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Question 5:

Draw a circle with the help of a bangle. Take any point P outside the circle. Construct the pair of tangents from the point P to the circle.

Answer:

Steps of Construction

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

Step 2. Mark a point P outside the circle.

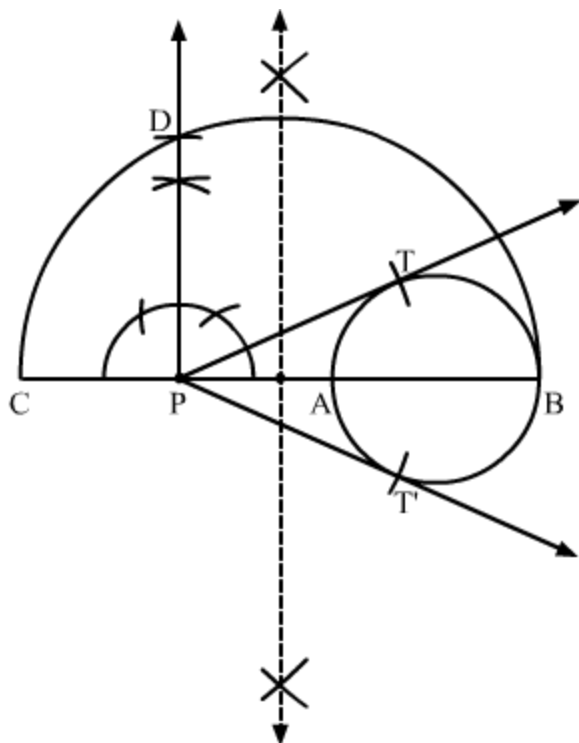**Step 3**. Through P, draw a secant PAB to intersect the circle at A and B.

Step 4. Produce AP to C such that PA = PC.

Step 5. Draw a semicircle with CB as diameter.

Step 6. Draw PD ⊥ BC, intersecting the semicircle at D.

Step 7. With P as centre and PD as radius, draw arcs to intersect the circle at T and T'.

Step 8. Join PT and PT'.

Here, PT and PT' are the required pair of tangents.

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Question 6:

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. [CBSE 2014]

Answer:

Steps of Construction

**Step 1**. Draw a line segment AB = 8 cm.

Step 2. With A as centre and radius 4 cm, draw a circle.

Step 3. With B as centre and radius 3 cm, draw another circle.

Step 4. Draw the perpendicular bisector XY of AB, cutting AB at C.

Step 5. With C as centre and radius AC (or BC), draw a circle intersecting the circle with centre A at P and P'; and the circle with centre B at Q and Q'.

Step 6. Join BP and BP'. Also, join AQ and AQ'.
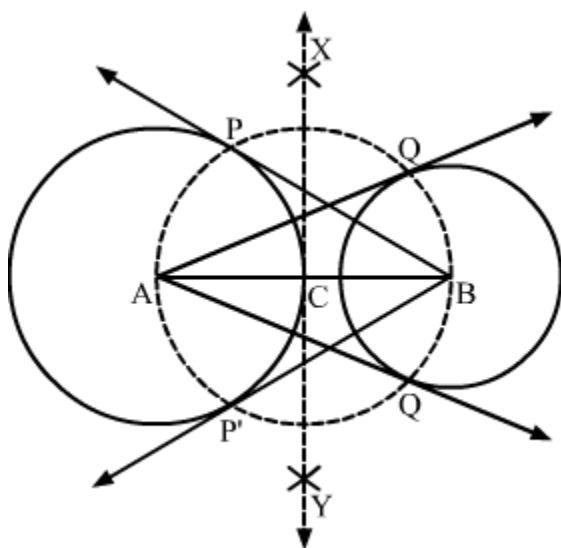
Here, AQ and AQ' are the tangents from A to the circle with centre B. Also, BP and BP' are the tangents from B to the circle with centre A.

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Question 7:

Draw a circle of radius 4.2 cm. Draw a pair of tangents to this circle inclined to each other at an angle of 45°.
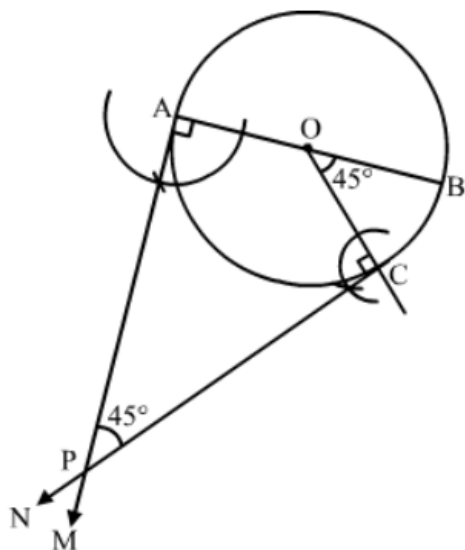
Answer:

Steps of Construction:

Step 1. Draw a circle with centre O and radius = 4.2 cm.

Step 2. Draw any diameter AOB of this circle.

Step 3. Construct ∠BOC =45°, such that the radius OC meets the circle at C.

Step 4. Draw AM ⊥AB and CN⊥OC.

AM and CN intersect at P.

Thus, PA and PC are the required tangents to the given circle inclined at an angle of 45°.

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Question 8:

Write the steps of construction for drawing a pair of tangents to a circle of radius 3 cm, which are inclined to each other at an angle of 60º.
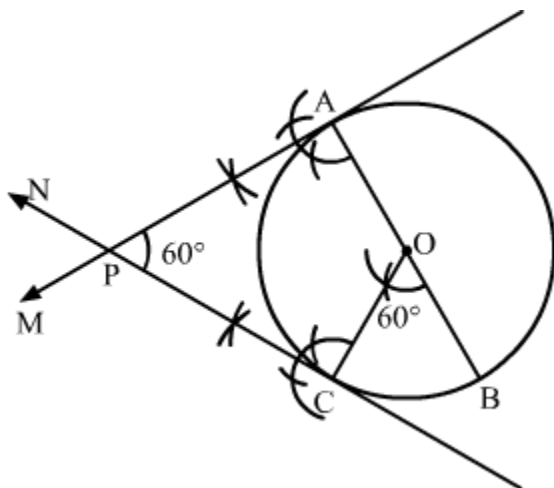
[CBSE 2011, '12, '14]

Answer:

Steps of Construction

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

Step 2. Draw any diameter AOB of the circle.

Step 3. Construct ∠BOC = 60º such that radius OC cuts the circle at C.

Step 4. Draw AM ⊥ AB and CN ⊥ OC. Suppose AM and CN intersect each other at P.

Here, AP and CP are the pair of tangents to the circle inclined to each other at an angle of 60º.

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Question 9:

Draw a circle of radius 3 cm. Draw a tangent to the circle making an angle of 30° with a line passing through the centre.
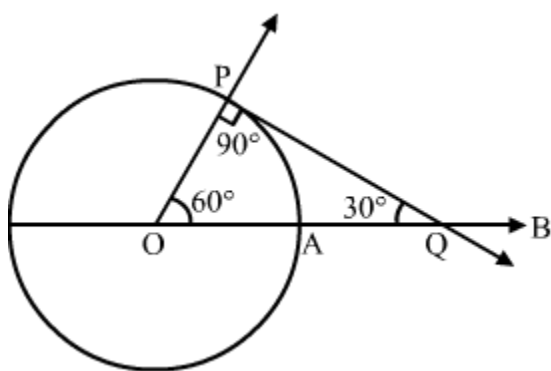
Answer:

Steps Of construction:

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

Step 2. Draw radius OA and produce it to B.

Step 3. Make ∠AOP = 60°.

Step 4. Draw PQ⊥OP, meeting OB at Q.

Step 5. Then, PQ is the desired tangent, such that ∠OQP = 30°.

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Question 10:

Construct a tangent to a circle of radius 4 cm from a point on the concentric circle of radius 6 cm and measure its length. Also, verify the measurement by actual calculation.

Answer:

Steps of Construction

Step 1. Mark a point O on the paper.

Step 2. With O as centre and radii 4 cm and 6 cm, draw two concentric circles.

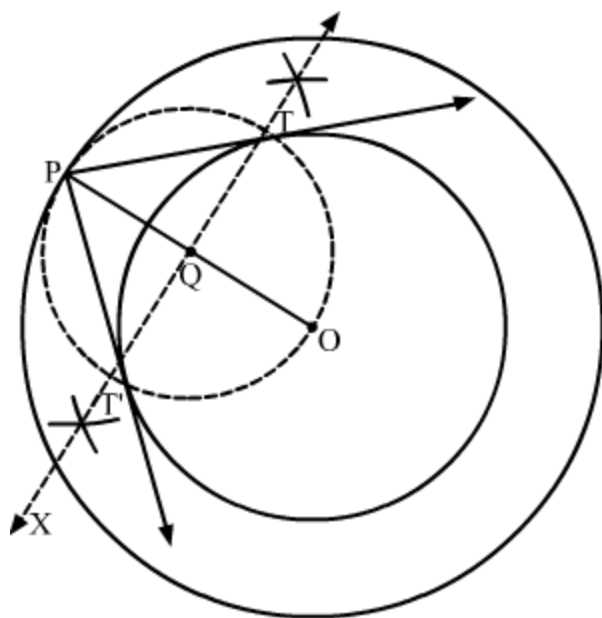**Step 3**. Mark a point P on the outer circle.

Step 4. Join OP.

Step 5. Draw the perpendicular bisector XY of OP, cutting OP at Q.

Step 6. Draw a circle with Q as centre and radius OQ (or PQ), to intersect the inner circle in points T and T'.

Step 7. Join PT and PT'.

Here, PT and PT' are the required tangents.

PT = PT' = 4.5 cm (Approx)

Verification by actual calculation

Join OT to form a right ∆OTP.　　　(Radius is perpendicular to the tangent at the point of contact)

In right ∆OTP,

$OP^2 = OT^2 + PT^2$　　Pythagoras Theorem $\Rightarrow PT = \sqrt{OP^2 - OT^2} \Rightarrow PT = \sqrt{6^2 - 4^2} = \sqrt{36 - 16} = \sqrt{20} \approx 4.5$ cm OP=6 cm and OT=4 cm

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Question 11:

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 inner circle.   [CBSE 2017]

Answer:

Steps of Construction
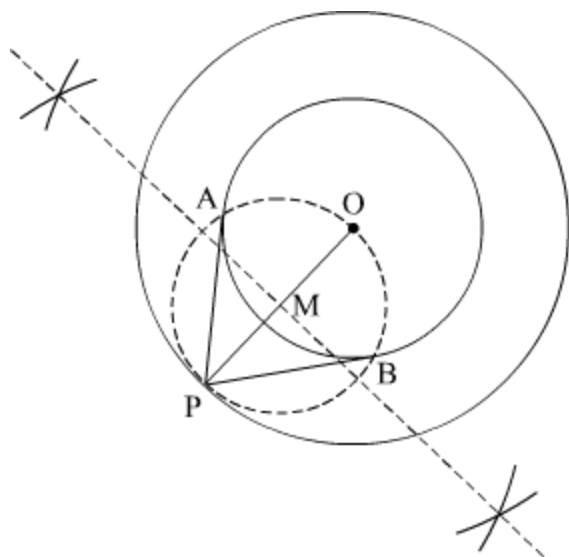
Step 1. Mark a point O on paper.

Step 2. Taking O as a centre, draw two concentric circles of radius 3 cm and 5 cm. Mark any random point P on outer circle.

Step 3. Join OP and draw its perpendicular bisector which meets OP at M.

Step 4. Draw a circle with M as centre and radius PM (or OM), to intersect the inner circle at the points A and B.

Step 5. Join PA and PB.

Here, PA and PB are the required tangents.

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Question 12:

Write the steps of construction to construct the tangents to a circle from an external point.

Answer:

Steps of Construction

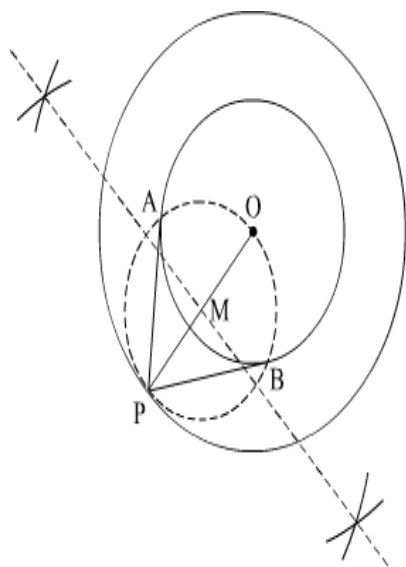**Step 1.** Draw a circle with O as centre and some radius.

Step 2. Mark a point P outside the circle. Join OP.

Step 3. Draw the perpendicular bisector of OP cutting it at M.

Step 4. Draw another circle with M as centre and radius MP (or OM), to intersect the given circle at the points A and B.

Step 5. Join PA and PB.

Here, PA and PB are the required tangents.

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Question 1:

Draw a line segment AB of length 5.4 cm. Divide it into six equal parts. Write the steps of construction.

Answer:

Steps of Construction :

Step 1 . Draw a line segment AB = 5.4 cm.

Step 2. Draw a ray AX, making an acute angle, ∠BAX.

$∠BAX$

.

Step 3. Along AX, mark 6 points A_1, A_2, A_3, A_4, A_5, A_6 such that,
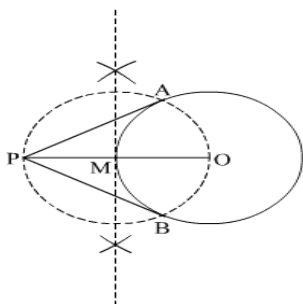
$$AA_1 = A_1A_2 = A_2A_3 = A_3A_4 = A_4A_5 = A_5A_6 .$$

Step 4. Join A_6B.

Step 5. Draw A_1C

$//$

A_2D, A_3D, A_4F and A_5G .

Thus, AB is divided into six equal parts.

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Question 2:

Draw a line segment *AB* of length 6.5 cm and divide it in the ratio 4 : 7. Measure each of the two parts.

Answer:

Steps of Construction :

Step 1 . Draw a line segment AB = 6.5 cm.
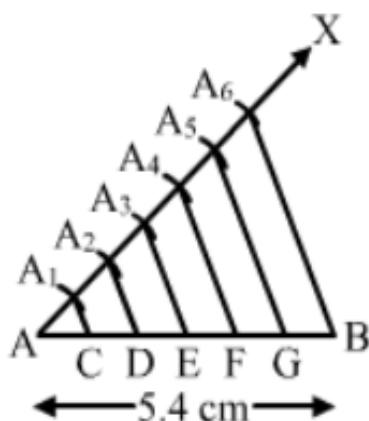
Step 2. Draw a ray AX, making an acute angle ∠BAX.

Step 3. Along AX, mark (4+7) =11 points $A_1, A_2, A_3, A_4, A_5, A_6, A_7, A_8, A_9, A_{10}, A_{11}$, such that

$$AA_1 = A_1A_2 = A_2A_3 = A_3A_4 = A_4A_5 = A_5A_6 = A_6A_7 = A_7A_8 = A_8A_9 = A_9A_{10} = A_{10}A_{11}$$

Step 4. Join $A_{11}B$.

Step 5. From A_4, draw A_4C ∥ $A_{11}B$, meeting AB at C.

Thus, C is the point on AB, which divides it in the ratio 4:7.

Thus, AC : CB = 4:7

From the figure, AC = 2.36 cm

CB = 4.14 cm

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Question 3:

Construct a △*ABC,* in which *BC* = 6.5 cm, *AB* = 4.5 cm and ∠*ABC* = 60°. Construct a triangle similar to this triangle whose sides are 34 the corresponding sides of △*ABC.*

Answer:

Steps of Construction :

Step 1. Draw a line segment BC = 6.5 cm.

Step 2. With B as centre, draw an angle of 60º.

Step 3. With B as centre and radius equal to 4.5 cm, draw an arc, cutting the angle at A.
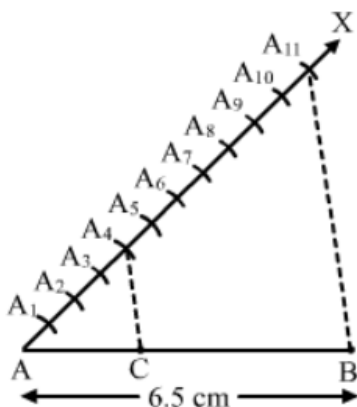
Step 4. Join AB and AC.

      Thus, △ ABC is obtained .

Step 5. Below BC, draw an acute ∠CBX.

Step 6. Along BX, mark off four points B_1, B_2, B_3, B_4, such that $BB_1 = B_1B_2 = B_2B_3 = B_3B_4$.

Step 7. Join B_4C.

Step 8. From B_3, draw B_3D ∥ B_4C, meeting BC at D.

Step 9. From D, draw DE ∥ CA, meeting AB at E.

Thus, △ EBD is the required triangle, each of whose sides is34 the corresponding sides of △*ABC.*

https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-10-maths-chapter-9-constructions/

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Question 4:

Construct a △*ABC,* in which *BC* = 5 cm, ∠ *C* = 60° and altitude from *A* is equal to 3 cm. Construct a △*ADE* similar to △*ABC,* such that each side of △*ADE* is 32 times the corresponding side of △*ABC.* Write the steps of construction.

Answer:

Steps of Construction :

Step 1. Draw a line *l* .

Step 2. Draw an angle of 90º at M on *l* .

Step 3. Cut an arc of radius 3 cm on the perpendicular. Mark the point as A.

Step 4. With A as centre, make an angle of 30°and let it cut *l* at C. We get ∠ACB = 60°.

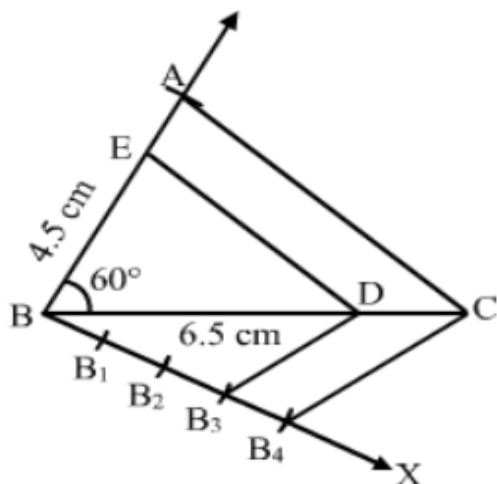Step 5. Cut an arc of 5 cm from C on *l* and mark the point as B.

Step 6. Join AB.

　　　Thus, △ABC is obtained .

Step 7. Extend AB to D, such that BD =12 BC.

Step 8. Draw DE ∥ BC, cutting AC produced to E.

Then, △ADE is the required triangle, each of whose sides is $\frac{3}{2}$of the corresponding sides of △ABC.

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Question 5:

Construct an isosceles triangle whose base is 9 cm and altitude 5 cm. Construct another triangle whose sides are 34 the corresponding sides of the first isosceles triangle.

Answer:

Steps of Construction :

Step 1. Draw a line segment BC = 9 cm.

Step 2. With B as centre, draw an arc each above and below BC.

Step 3. With C as centre, draw an arc each above and below BC.

Step 4. Join their points of intersection to obtain the perpendicular bisector of BC. Let it intersect BC at D.

Step 5. From D, cut an arc of radius 5 cm and mark the point as A.

Step 6. Join AB and AC.

https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-10-maths-chapter-9-constructions/
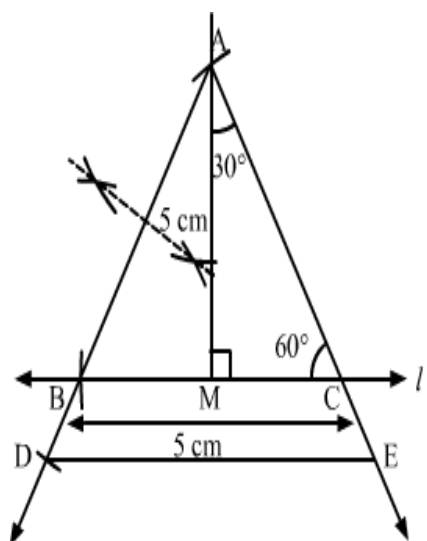
Thus, △ABC is obtained .

Step 5. Below BC, make an acute ∠CBX.

Step 6. Along BX, mark off four points B_1, B_2, B_3, B_4, such that $BB_1 = B_1B_2 = B_2B_3 = B_3B_4$.

Step 7. Join B_4C.

Step 8. From B_3, draw B_3E ∥ B_4C, meeting BC at E.

Step 9. From E, draw EF ∥ CA, meeting AB at F.

Thus, △FBE is the required triangle, each of whose sides is 34 the corresponding sides of the first triangle.

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Question 6:

Draw *ΔABC*, right-angled at *B*, such that *AB* = 3 cm and *BC* = 4 cm. Now, construct a triangle similar to *ΔABC*, each of whose sides is 75 times the corresponding sides of *ΔABC*.

Answer:

Steps of Construction :

Step 1. Draw a line segment BC = 4 cm.

Step 2. With B as centre, draw an angle of 90°.

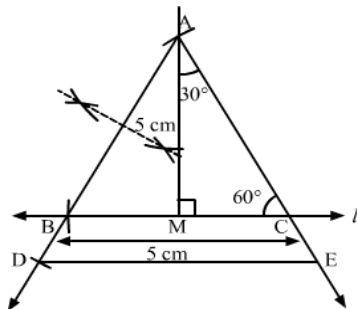Step 3. With B as centre and radius equal to 3 cm, cut an arc at the right angle and name it A.

Step 4. Join AB and AC.

     Thus, △ ABC is obtained .

Step 5. Extend BC to D, such that BD = 75 BC =   75 (4) cm = 5.6 cm.

Step 6. Draw DE ∥ CA, cutting AB produced to E.

Thus, △EBD is the required triangle, each of whose sides is 75 the corresponding sides of △*ABC*.

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Question 7:

Draw a circle of radius 4.8 cm. Take a point *P* on it. Without using the centre of the circle, construct a tangent at the point *P*. Write the steps of construction.

Answer:

Steps of Construction :

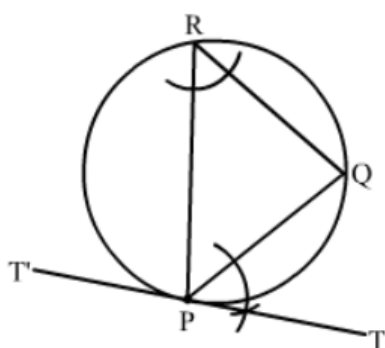Step 1. Draw a circle of radius 4.8 cm.

Step 2. Mark a point P on it.

Step 3. Draw any chord PQ.

Step 4. Take a point R on the major arc QP.

Step 5. Join PR and RQ.

Step 6. Draw ∠QPT = ∠PRQ

Step 7. Produce TP to T', as shown in the figure.

T'PT is the required tangent.

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Question 8:

Draw a circle of radius 3.5 cm. Draw a pair of tangents to this circle, which are inclined to each other at an angle of 60°. Write the steps of construction.

Answer:

Steps of Construction:
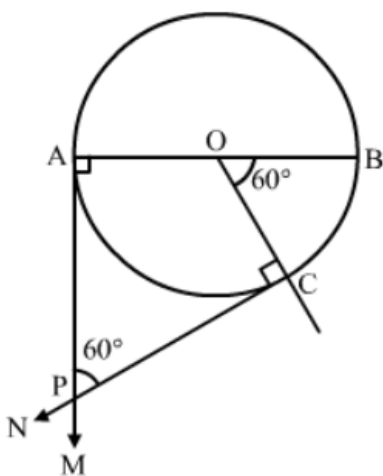
Step 1. Draw a circle with centre O and radius = 3.5 cm.

Step 2. Draw any diameter AOB of this circle.

Step 3. Construct ∠BOC = 60° , such that the radius OC meets the circle at C.

Step 4. Draw MA ⊥AB and NC⊥OC.

⊥AB and CN⊥OC.
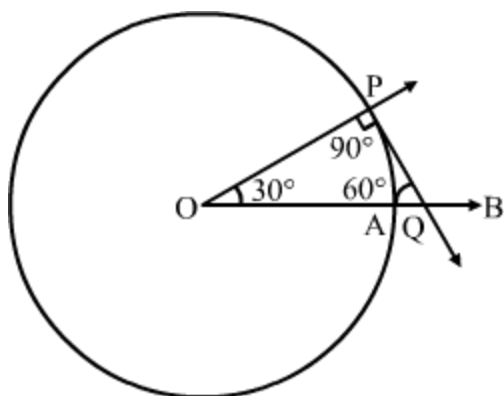
Let AM and CN intersect at P.

Then, PA and PC are the required tangents to the given circle that are inclined at an angle of 60º.

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Question 9:

Draw a circle of radius 4 cm. Draw a tangent to the circle, making an angle of 60° with a line passing through the centre.

Answer:

Steps Of construction:

Step 1. Draw a circle with centre O and radius 4 cm.

Step 2. Draw radius OA and produce it to B.

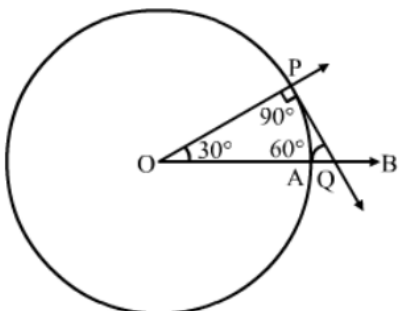Step 3. Make ∠AOP = 30°

$∠AOP = 60°$

.

Step 4. Draw PQ ⊥OP , meeting OB at Q.

Step 5. Then, PQ is the desired tangent, such that ∠OQP = 60°.

∠OQP = 30°

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Question 10:

Draw two concentric circles of radii 4 cm and 6 cm. Construct a tangent to the smaller circle from a point on the larger circle. Measure the length of this tangent.

Answer:

Steps of Construction :

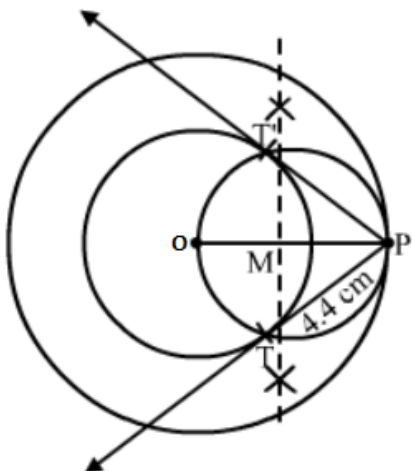Step 1. Draw a circle with O as centre and radius 6 cm.

Step 2. Draw another circle with O as centre and radius 4 cm.

Step 2 . Mark a point P on the circle with radius 6 cm.

Step 3. Join OP and bisect it at M.

Step 4. Draw a circle with M as centre and radius equal to MP to intersect the given circle with radius 4 cm at points T and T˙.

Step 5. Join PT and P T˙.

Thus, PT or P T'are the required tangents and measure 4.4 cm each.

---X---

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He was born on January 2, 1946 in a village of Delhi. He graduated from Kirori Mal College, University of Delhi. After completing his M.Sc. in Mathematics in 1969, he joined N.A.S. College, Meerut, as a lecturer. In 1976, he was awarded a fellowship for 3 years and joined the University of Delhi for his Ph.D. Thereafter, he was promoted as a reader in N.A.S. College, Meerut. In 1999, he joined M.M.H. College, Ghaziabad, as a reader and took voluntary retirement in 2003. He has authored more than 75 titles ranging from Nursery to M. Sc. He has also written books for competitive examinations right from the clerical grade to the I.A.S. level.

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