

MATHEMATICS NOTES FOR CLASS 10TH (FOR SINDH)

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Chap 7 PRACTICAL GEOMETRY

MULTIPLE CHOICE (MCQ's)

- (i) A point dividing the line segment into two equal parts is called -----
- (a) Mid point (b) Point of trisection
(c) Median (d) Altitude
- (ii) A tangent is a line touching the circle at -----
- (a) Two points (b) one points
(c) Three points (d) No points
- (iii) Half length of diameter is called -----
- (a) Radius (b) center
(c) Tangent (d) Mid point
- (iv) The tangents at the end points of the diameter of a circle are-----
- (a) Collinear (b) Parallel
(c) Non Parallel (d) Perpendicular
- (v) Two circles of different radii are -----
- (a) Similar (b) Equal
(c) Equal in area (d) Congruent
- (vi) Number of tangents that can be drawn from a point outside a circle are -----
- (a) Two (b) three (c) none (d) More than two
- (vii) A circle touching three sides of a triangle internally is called-----
- (a) Incircle (b) Circumcircle

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- (c) e-circle opposite to A (d) e-circle opposite to B
- (viii) In certain figure are exactly alike but are different in size are called -----
- (a) **similar** (b) Median
- (c) **Equal** (d) **Proportional**
- (ix) A circle passing through the three vertices of a triangle is called-----
- (a) **Incircle** (b) **Circumcircle**
- (c) e-circle opposite to A (d) e-circle opposite to B
- (x) The medians of a triangle are always-----
- (a) **Collinear** (b) **Concurrent**
- (c) **Congruent** (d) **Perpendicular**
- (xi) The right bisectors of the sides of every triangle are -----
- (a) **Collinear** (b) **Parallel**
- (c) **Concurrent** (d) **Congruent**

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EXERCISE 7.1

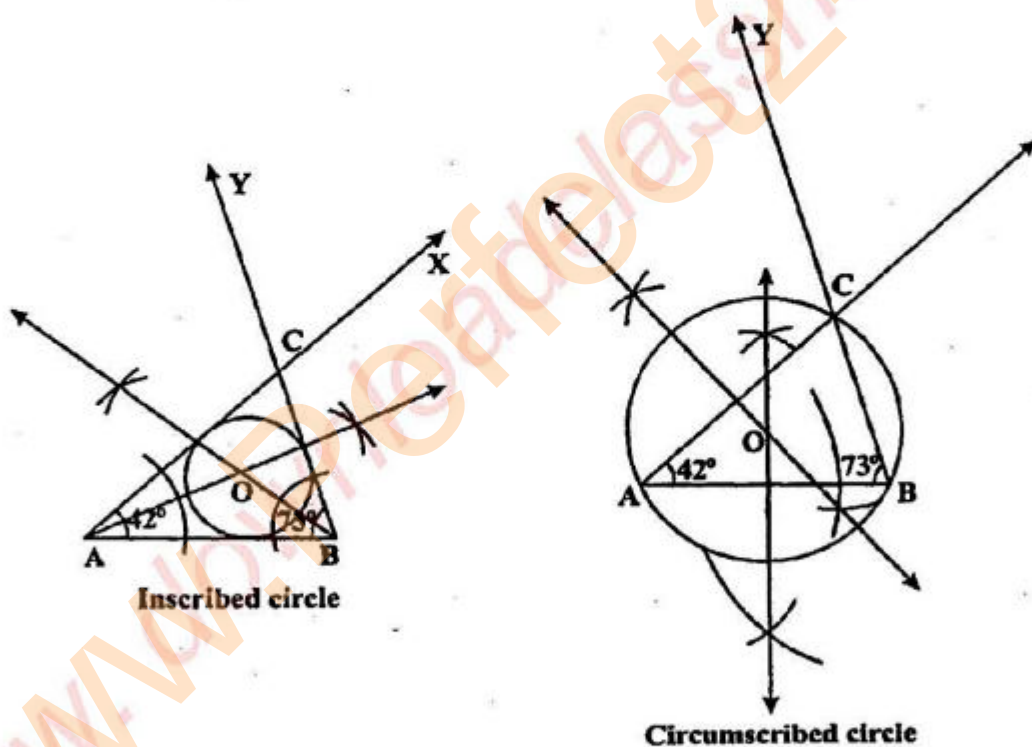
Q.1. Construct the following triangles. Draw inscribed and circumscribed circles in each case.

(i) $m\overline{AB} = 3.4 \text{ cm}, m\angle A = 40^\circ, m\angle B = 73^\circ$

(ii) $m\overline{AB} = 4 \text{ cm}, m\overline{BC} = 3 \text{ cm}, m\overline{CA} = 5 \text{ cm}$

(iii) $m\overline{AB} = 4.5 \text{ cm}, m\overline{BC} = 5 \text{ cm}, m\angle B = 60^\circ$

SOLUTION: (i)



Q.2. Construct the following triangles. Draw the escribed circle opposite to the vertex F in each case.

(i) $m\overline{DF} = 5 \text{ cm}, m\overline{EF} = 4.5 \text{ cm}, m\angle F = 80^\circ$

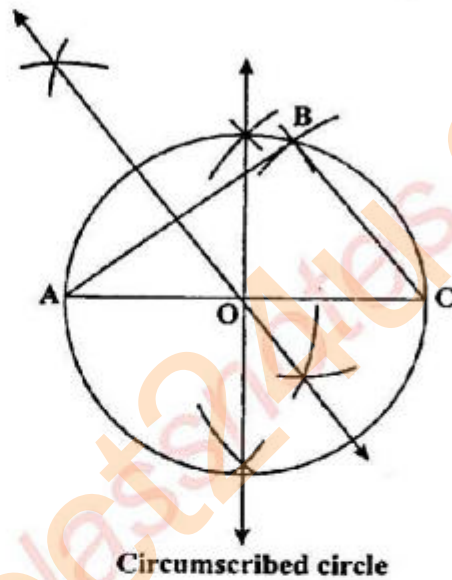
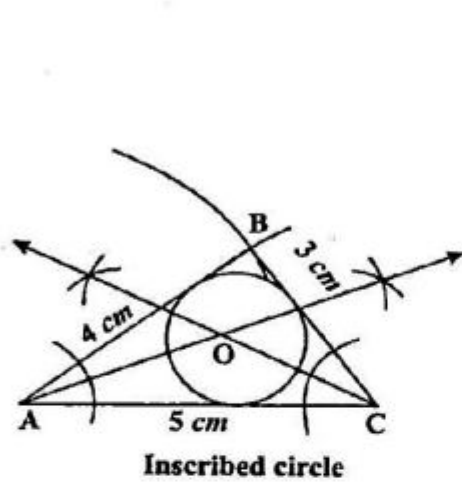
(ii) $m\angle E = 45^\circ, \angle F = 60^\circ, m\overline{DF} = 5 \text{ cm}$

(iii) $m\overline{DF} = 3.5 \text{ cm}, m\overline{EF} = 4 \text{ cm}, m\overline{FD} = 4.6 \text{ cm}$

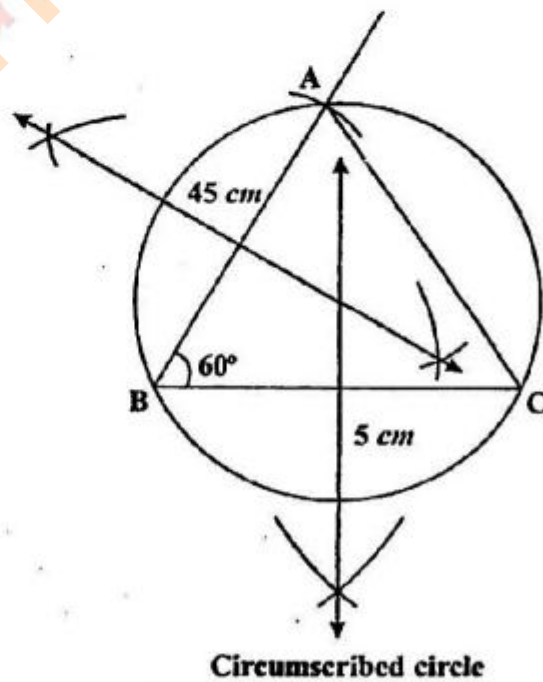
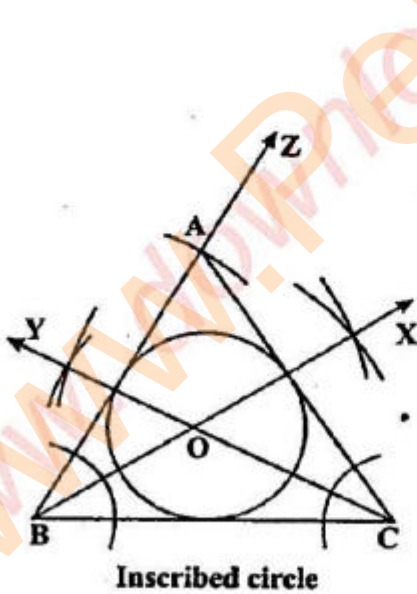
SOLUTION: (II)

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(iii)



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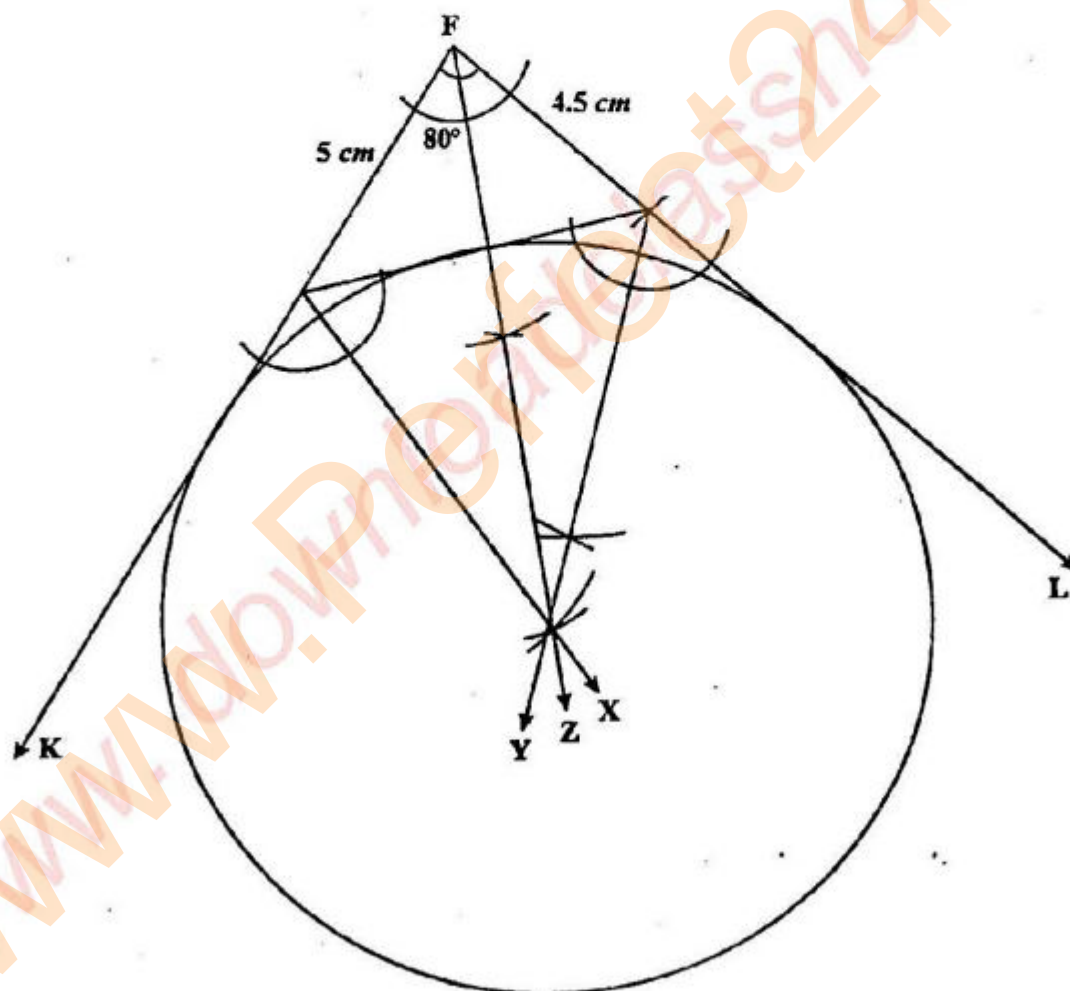
Q.2. Convert the following triangles. Draw the escribed circle opposite to the vertex F in each case.

(i) $m\overline{DF} = 5\text{cm}, m\overline{EF} = 4.5\text{ cm}, m\angle F = 80^\circ$

(ii) $m\angle E = 45^\circ, \angle F = 60^\circ, m\overline{DF} = 5\text{cm}$

(iii) $m\overline{DE} = 3.5\text{ cm}, m\overline{EF} = 4\text{cm}, m\overline{FD} = 4.6\text{ cm}$

SOLUTION: (i)



Escribed circle opposite to the $\angle F$.

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$$(ii) \therefore \angle E + m\angle F + m\angle D = 180^\circ$$

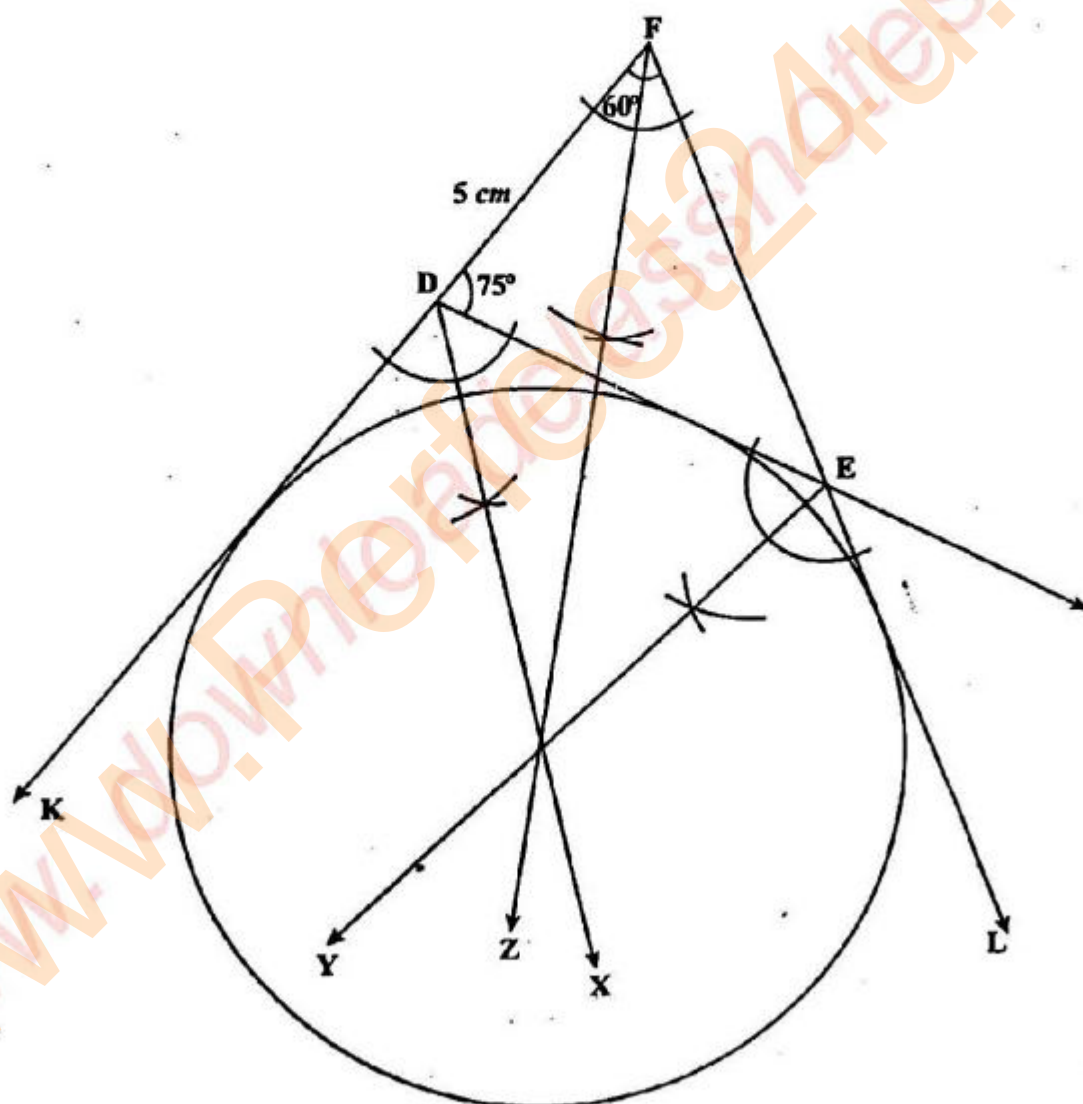
$$\Rightarrow m\angle D = 180^\circ - m\angle E - m\angle F$$

$$= 180^\circ - 45^\circ - 60^\circ$$

$$= 180^\circ - 105^\circ$$

$$= 75^\circ$$

$$(\therefore m\angle E = 45^\circ; m\angle F = 60^\circ)$$



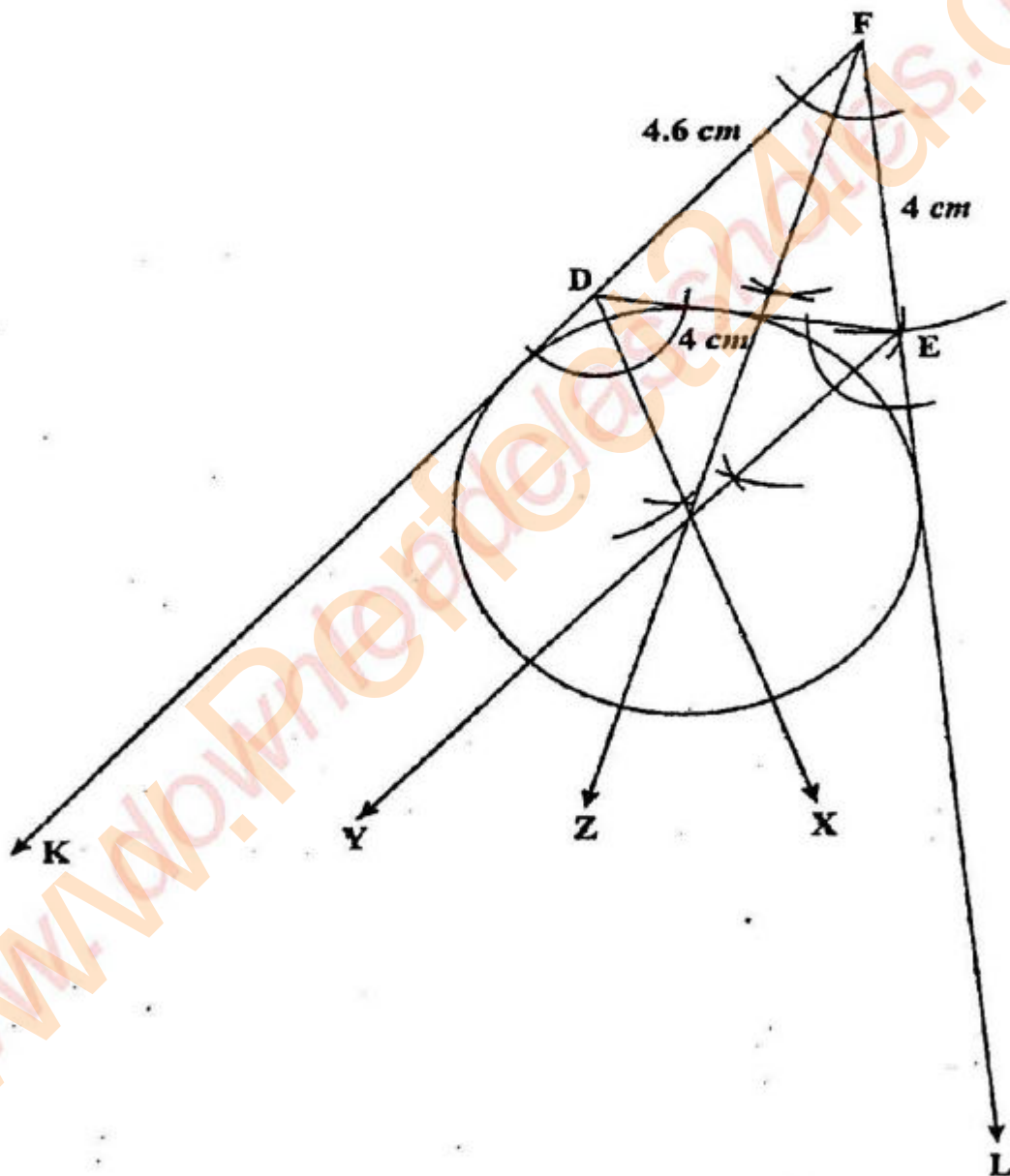
Escribed circle opposite to the $\angle F$.

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(III) $m\overline{DE} = 3.5 \text{ cm}$, $m\overline{EF} = 4 \text{ cm}$, $m\overline{FD} = 4.6 \text{ cm}$



Escribed circle opposite to the $\angle F$.

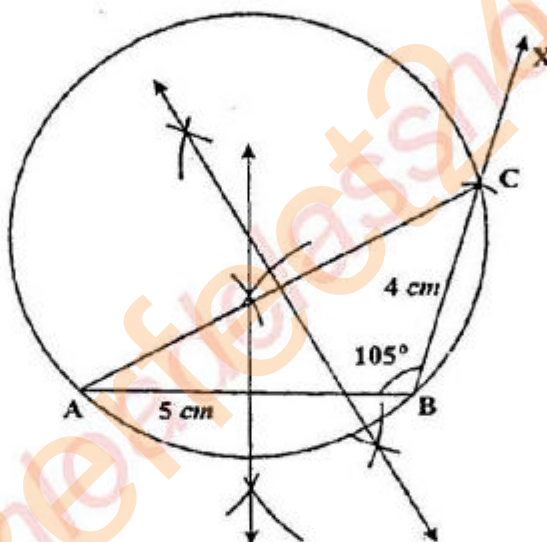
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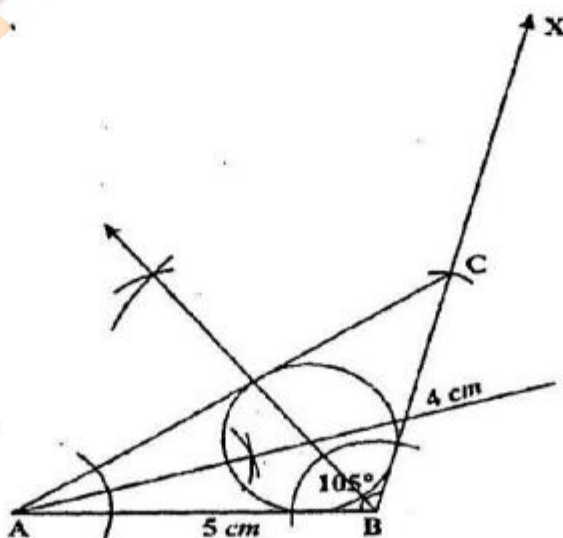
Q.3. Construct a triangle ABC in which $m\overline{AB} = 5\text{cm}$, $m\angle B = 105^\circ$ and $m\overline{BC} = 4\text{cm}$. Draw

- (i) its circumscribed circle.**
- (ii) its inscribed circle.**
- (iii) its escribed circle opposite to the $\angle A$.**

SOLUTION: (i) Circumscribed Circle



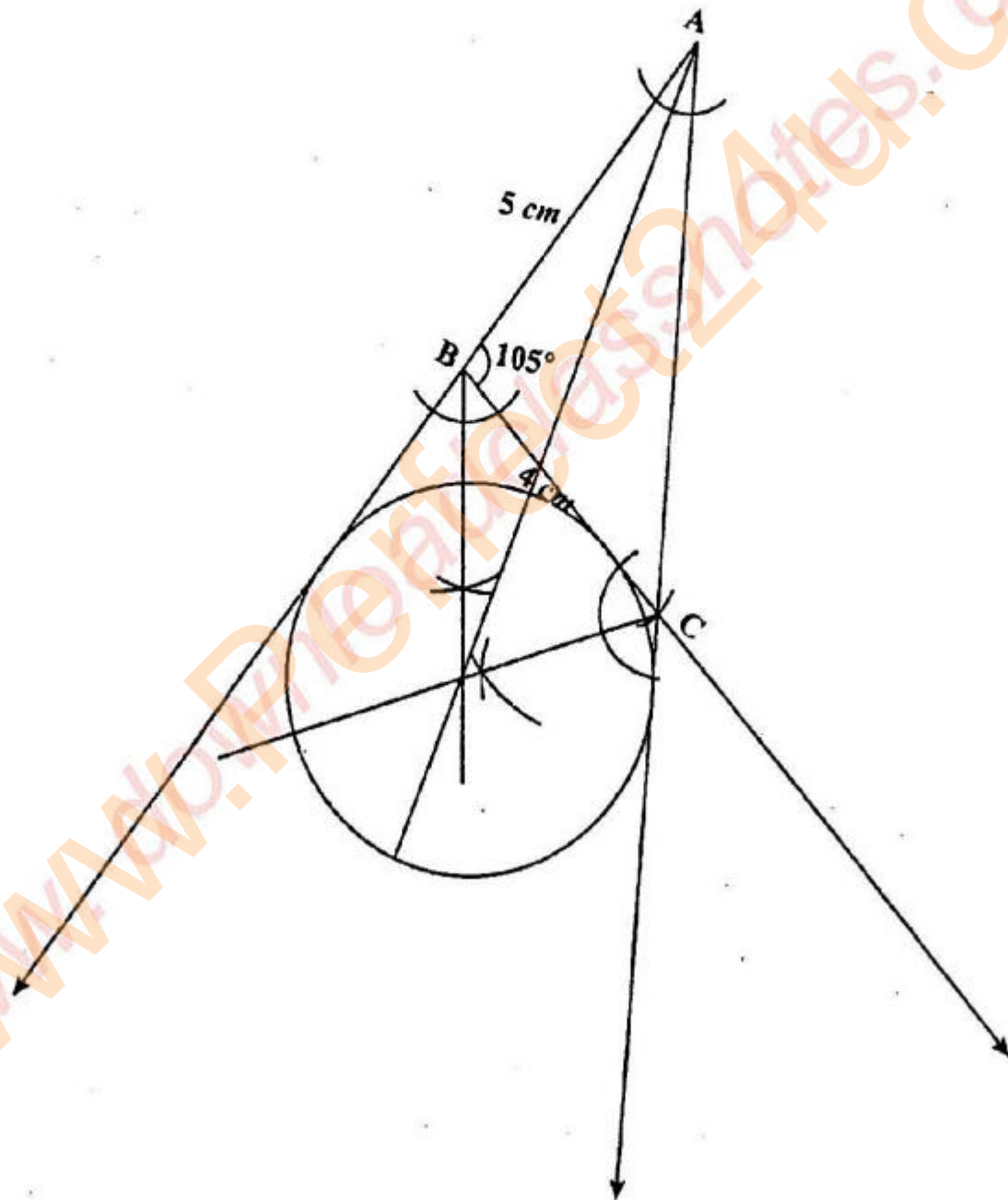
(ii) Inscribed Circle



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(iii) Escribed circle opposite to the $\angle A$.



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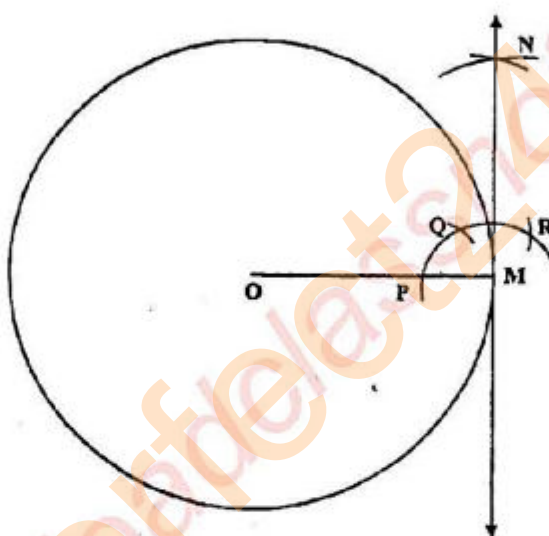
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EXERCISE 7.2

Q.1. Draw a circle with radius 4.5 cm. Draw a tangent at a point M to the circle.

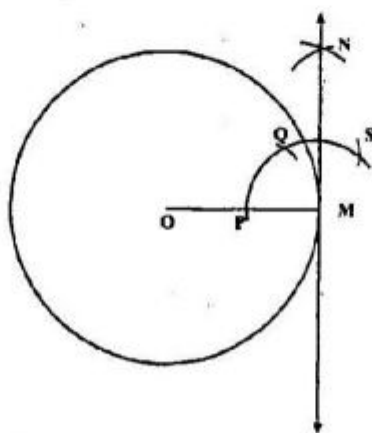
SOLUTION:



Tangent at a point M to the circle

Q2. Draw a circle of radius 3.5 cm and repeat construction of Question 1.

SOLUTION:



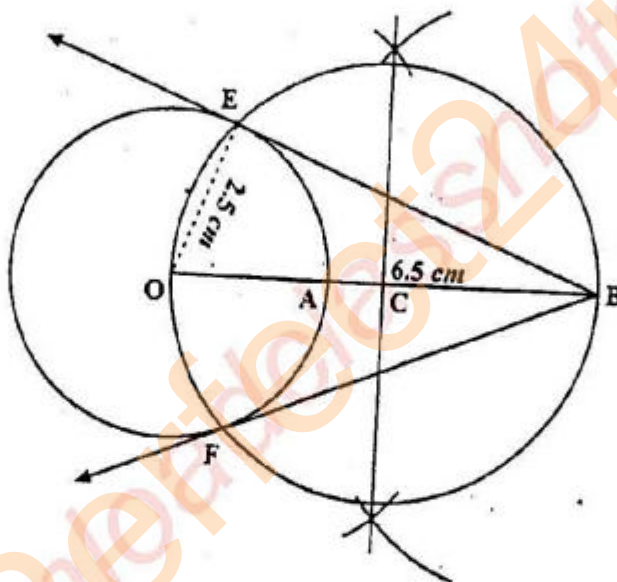
Tangent at a point M to the circle

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Q.3. Draw a circle of radius 2.5 cm. Take a point B at a distance of 6.5 cm from the centre of the circle and draw two tangents to the circle passing through B. Find the length of the segments of tangents by measuring them. Verify your measurement with the help of the Pythagoras theorem.

SOLUTION:



Length of the segments of tangents by measuring them is:

$$m\overline{BE} = m\overline{BF} = 6 \text{ cm}$$

To verify:

Using Pythagoras Theorem for $\triangle QPO$,

$$\begin{aligned} (m\overline{OB})^2 &= (m\overline{OE})^2 + (m\overline{BE})^2 \\ \Rightarrow (m\overline{BE})^2 &= (m\overline{OB})^2 - (m\overline{OE})^2 \\ &= (6.5)^2 - (2.5)^2 \\ &= 42.25 - 6.25 \\ &= 36 \end{aligned}$$

$$\therefore m\overline{BE} = 6 \text{ cm}$$

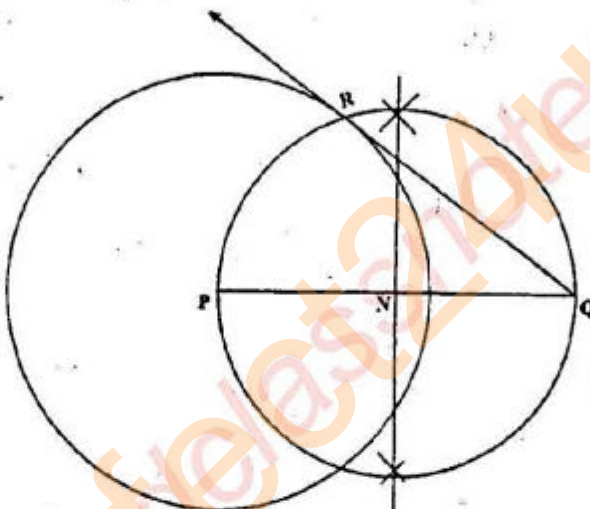
Hence, it is verified.

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Q.4. The distance between two points P and Q is 7.5 cm. with the centre P draw a circle of radius 4.5 cm. from the point Q draw a tangent to the circle. Measure the segment of the tangent.

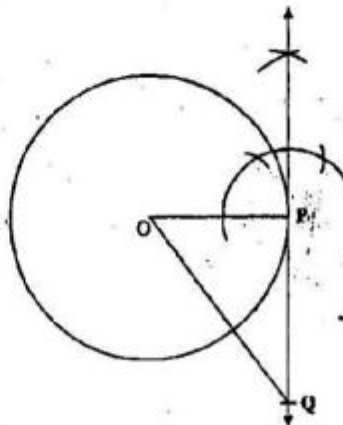
SOLUTION:



Length of segment of tangent = $m\overline{QR} = 6 \text{ cm}$

Q.5. Draw a circle with radius 3 cm. At any point P of the circle, draw a tangent. Take a point Q on this tangent such that the distance between the point of contact and Q is 4 cm. Measure the distance between the point Q and the centre and verify your measurement with the help of the Pythagoras theorem.

SOLUTION:



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$$\therefore m\overline{OP} = 3\text{cm} ; m\overline{PQ} = 4\text{cm}$$

After measuring $m\overline{OQ} = 5\text{cm}$

To verify:

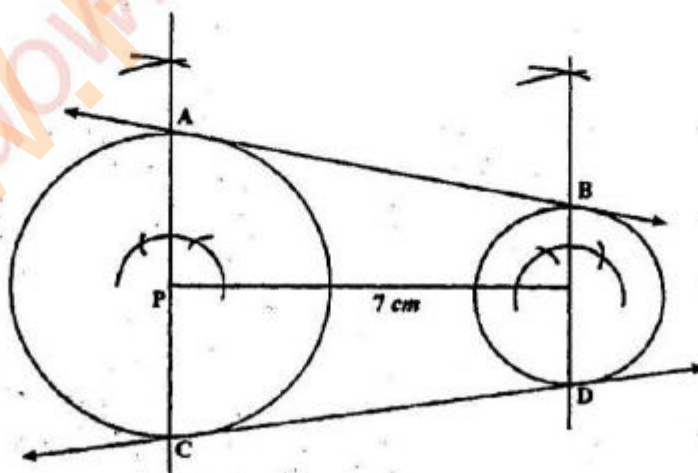
Using Pythagoras Theorem for ΔQPO ,

$$\begin{aligned} (m\overline{OQ})^2 &= (m\overline{PQ})^2 + (m\overline{OP})^2 \\ &= (4)^2 + (3)^2 \\ &= 16 + 9 \\ &= 25 \end{aligned}$$

$$\therefore m\overline{OQ} = 5\text{ cm} \quad \text{Hence, it is verified.}$$

Q.6. Take two points P and Q at distance 7 cm. Draw circles with the radii of 2.8cm, 1.6 cm and centers at P, Q respectively. Draw direct common tangents of these circles. Measure the line segment joining the points of contact with each circle.

SOLUTION:



Direct common tangents.

$$m\overline{AB} = m\overline{CD} = 6.9\text{ cm}$$

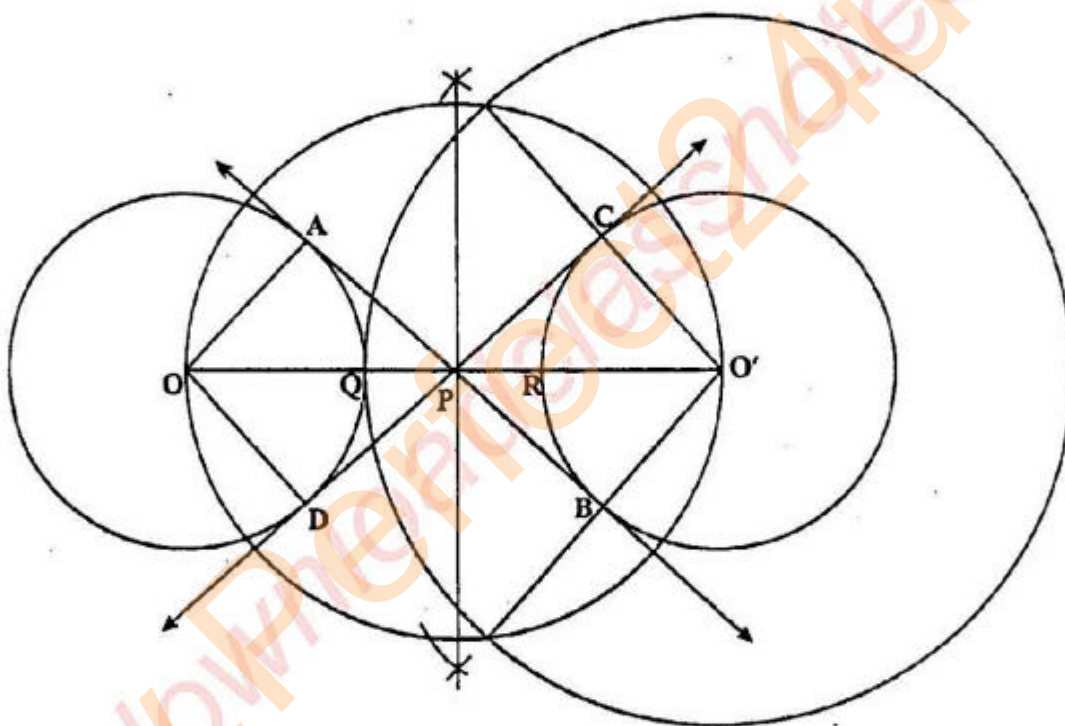
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Q.7. Take two circles of radii 3 cm, having the distance between their centers equal to 9 cm. Draw the transverse common tangents to these circles. Measure the line segments joining their points of contact.

SOLUTION:



Transverse common tangents to the given circles.

Here $m\overline{OO'} = 9 \text{ cm}$, $m\overline{OQ} = 3 \text{ cm} = m\overline{RO'}$

So, the line segments joining points of contact is :

$$m\overline{AB} = m\overline{CD} = 6.7 \text{ cm.}$$

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