Grade 11

MATHEMATICS

24. Tangent

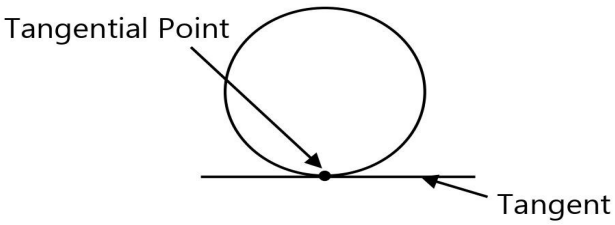
By Studying this leson you will be able to,

- Identify the tangent which is drawn through a point on a circle and it s characteristics.
- Identify the tangents drawn to a circle form an external point and theire characteristice.
- Identify the angles in the alternate segment and solve related Problems.

INTRODUCTION

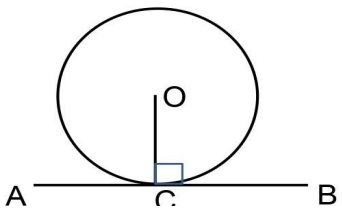
Tangent : If a line meets a circle at a point which the only point common to that line and the circle ,then that line is called as a tangent to the circle

Tangential Point :The point which is common to the tangent and the circle is called as the tangential point.



Theorem : The Straight line drawn through a Point On a circle and perpendiular to the radius through the point of contact (Tangential Point) is a tangent to the circle.

Converse of the theorem : The tangent through a point on a circle is perpendicular to the radius drawn to the point of Contarct



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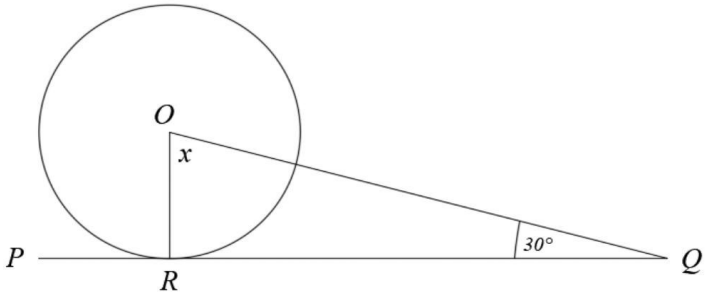
Excrcise 01

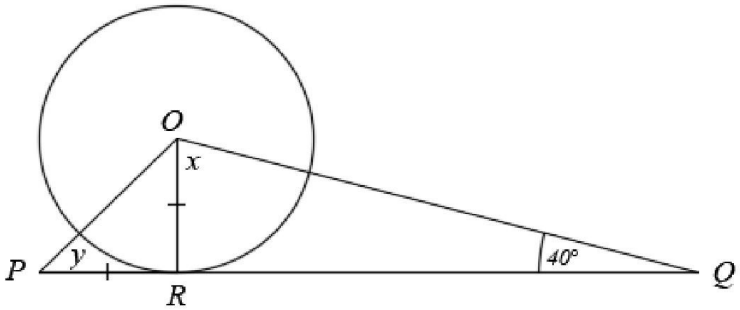
01). In the follwing figure , the tangent drawn to the circle with centre O through R is PO



Accoriding to the data,

i. Wirte a relationship in Between PQ and OR
ii. Find the value of X

02 . The tangent drawn to the cirle with centre O through C is AB

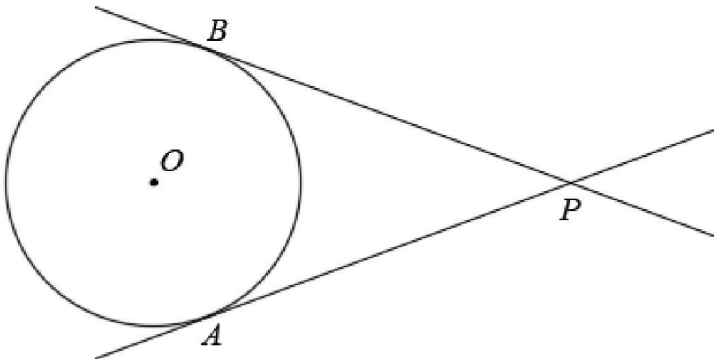


According to the data,find the value of X and Y

Tangents drawn to a circle form an external point

Introduction

Two tangents can be drawn to a circle form an External Point.



P - The External Point
AP,BP - Tangents

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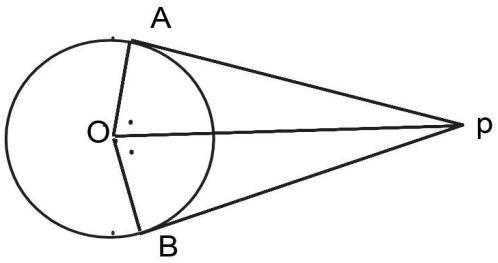
Theorem

If two tangent are trawn to a circle form an external point , then ,

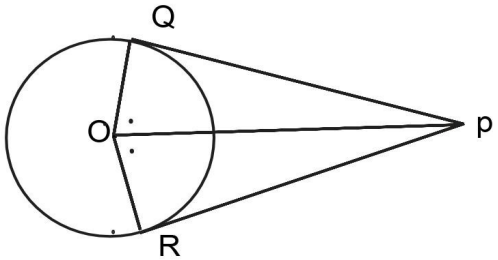
i. The two tangents equal in length.
ii. The angle between the tangents is bisected by the staight line joinng thr external point to the centre.
iii. The tangents subtend equal angles at the centre.



i. AP=BP
ii. $\hat{APO} = \hat{BPO}$
iii. $\hat{POA} = \hat{POB}$

Exercise - 02

01 The tangents through the points Q and R on the circle With centre O in the figure,Meet at P



Fill in the folloing blanks to prove that the two triangles PQO and are congruent.

OQ = OR (.....)

..... = ... (Common Side)

PQO Δ = PRO(Hyp.s)

Write the Perimeter of the triangle ABC

02 . Find the perimeter of the triangle ABC

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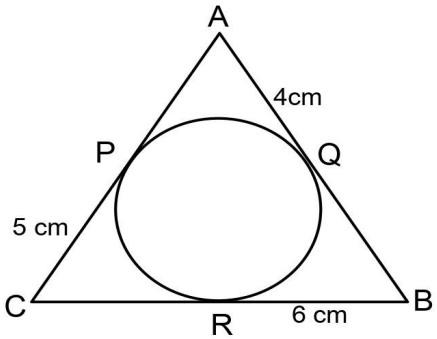

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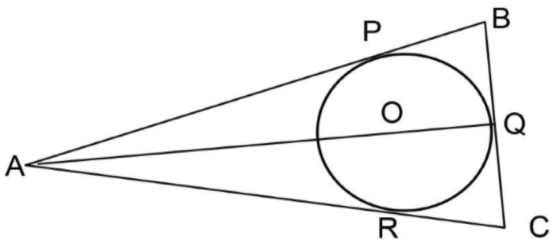
3. The Straight line AB,BC,and AC touch the Circle with centre O at P,Q and R respectively

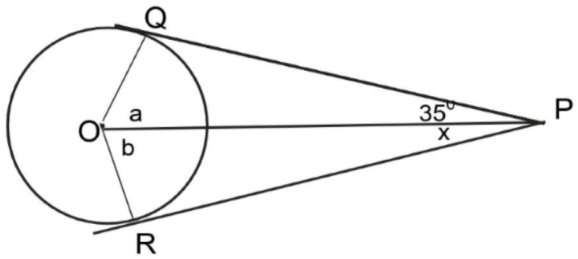


AQ = 12 cm හා BQ = 5 cm නම්,

i. AB Find the Lenght of AB

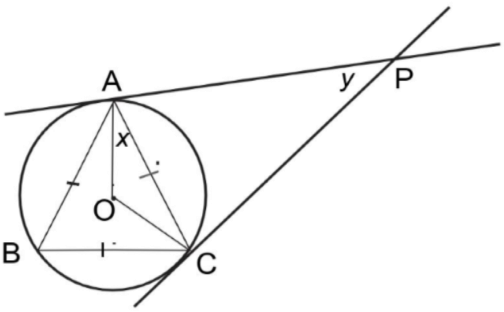
ii. Find the Length of AR

04. The Straight line AB,BC,and AC touch the Circle with centrre O at PQ,and PR



Find the values of X,a, and b

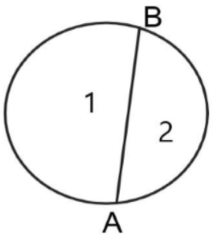
05. The tangents drawn form the external point P to The Circle with Centre O are AP and PC find the Value of X and Y



Angles in the allernate Segment

Introduction

The Segments of a Cricle :- A circle is divided into two Segments by a chord.



AB - The chord

1 - Major Segment

2 - Minor Segment

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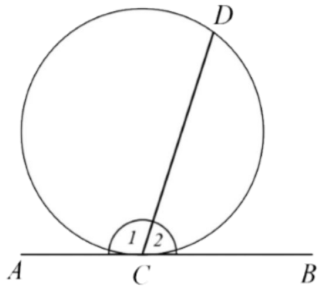
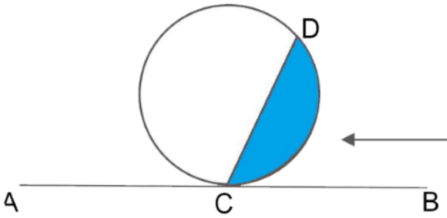
There are two angles formed formed by a about meeting a tangent



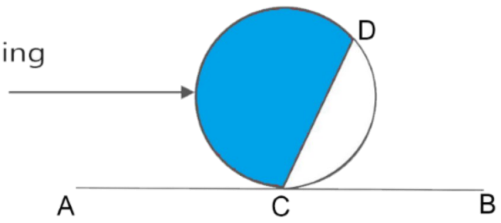
AB - The tangent
C - Tangential Point
CD - The chord
1 , 2 - The angles made by the chord and the tangent

The alternate segment

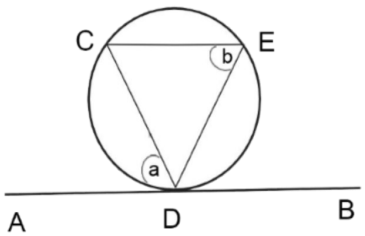


The Alternate segment corresponding to $A\hat{C}D$

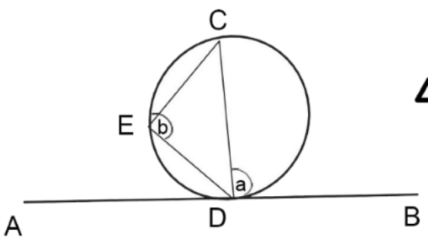
The alternate segment Corresponding to $B\hat{C}D$



Theorem:- The nglees wich a tangent to a circle makes with a chord drawn form the point contact are respectively equal to the angles in the alternate segments of the circle.



a - The angle which the tangent to the circle makes with the chord .



b- a The angle in the alternate segment of the circle.

Δ a = b.

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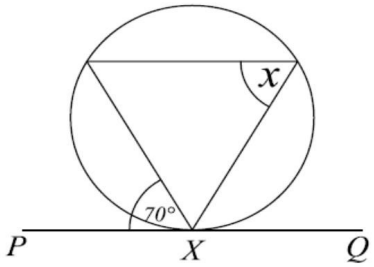
Exercise - 03

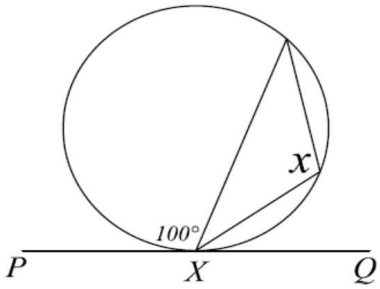
PQ is a tangent to the circle through the point x

01.



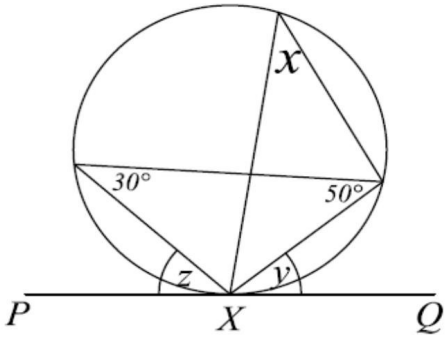
find the value of x

02.

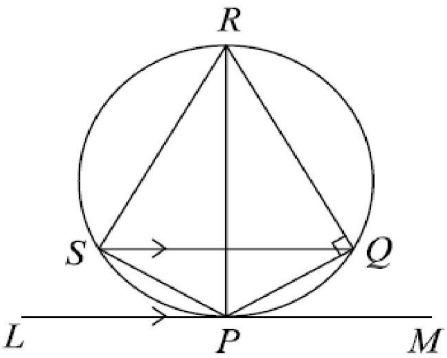


Find the Value of x

03. Find the values of x, y and z



04. LM is a tangent to the circle through the point P the Points P,Q,R, and S lie on the Circle



i. Write down an angle which is equal to $Q\hat{P}M$ Give reasons

ii. Show that PR is the Angle bisector of $Q\hat{R}S$

iii. Show that PQ=PS.

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