

Class – X
Lesson Plan

Topic : Circles

Brief Description of the lesson: In this chapter learners will learn about the existence of the tangents to a circle and some of the properties of tangents and their applications

UN Sustainable Goals to be achieved (if any): Quality Education

Objectives: (put Bloom's level)

Specific Objectives:

Students will be able to:

1. Learn meaning of circle and various terms such as chord, diameter, centre, circumference, segment sector etc, Apply chord properties for proof of further theorems in circles. (K)
2. Define a tangent and recognize that a tangent is perpendicular to the radius of the circle at the point of tangency. (U)
3. Explain there is only one tangent at a point of the circle. (U)
4. Define the point of contact of tangent (K)
5. Understand and Prove that two tangent to a circle from a common point outside the circle are equal. (U)
6. Prove that the line joining the external points to the centre of the circle bisect the angle between the tangents. (An)
7. Explore properties of tangent and how they differ from secant. (An)
8. Conceptualize that tangent to a circle is a special case of the secant, when the two end points of its corresponding chord coincides. (SY)

Behavioral objective:-After getting the concept of tangents student will think critically the application of these properties in their day to day life like

- In determining the best position a soccer player should be when parallel to the sidelines, to score a goal.
- Rotation of wheels on road.
- In building infrastructure roads sidewalls pipe runs it is very important to know where a point of tangent begins and the curve ends.
- Tangent to a curve is used for finding instantaneous velocity in physics.

Skill

- Observation
- Critical thinking
- Analysis
- Application
- Reasoning

Activity to introduce lesson:

1. Condition arises when a line and a circle is given in a plane (non- intersecting, secant and tangent)
2. Number of Common tangents when two circles intersect at different points.

Activity to support learning:

TANGENTS DRAWN FROM AN EXTERNAL POINT OF A CIRCLE.

Objective: To verify using the method of paper cutting, pasting and folding that the lengths of tangents drawn from an external point are equal.

Expected learning outcome :

Students would be able to:

1. Learn meaning of circle and various terms such as chord, diameter, centre, circumference, segment sector etc, Apply chord properties for proof of further theorems in circles.
2. Define a tangent and recognize that a tangent is perpendicular to the radius of the circle at the point of tangency.
3. Explain there is only one tangent at a point of the circle.
4. Define the point of contact of tangent
5. Understand and Prove that two tangent to a circle from a common point outside the circle are equal.
6. Prove that the line joining the external points to the centre of the circle bisect the angle between the tangents.
7. Explore properties of tangent and how they differ from secant.
8. Conceptualize that tangent to a circle is a special case of the secant, when the two end points of its corresponding chord coincides.

Assessment based on SOLO taxonomy – (1 Mark for each question)

1. If radii of two concentric circles are 4 cm and 5 cm, then length of each chord of one circle which is tangent to the other circle, is: (US)
a. 3 cm b) 6 cm c) 9cm d) 1 cm
2. If PQ is the tangent to the circle with centre O, OP = 13cm and OQ = 5 cm, then PQ is equals to: (MS)
a) 7 cm b) 15 cm c) 12 cm d) 14 cm
3. At one end A of a diameter AB of a circle of radius 5 cm, tangent XAY is drawn to the circle. The length of chord CD parallel to XY and at a distance 8 cm from A, is: (MS)
a) 4 cm b) 5 cm c) 6 cm) d) 8 cm
4. From a point P which is at a distance of 13 cm from the centre O of a circle of radius 5 cm, the pair of tangents PQ and PR to the circle is drawn. Then, the area of the quadrilateral PQRS is: (RE)
b) 60 cm^2 b) 65 cm^2 c) 30 cm^2 d) 32.5 cm^2
5. If two tangents inclined at an angle 60° are drawn to a circle of radius 3 cm, then the length of each tangent is: (EA)
a) $\frac{3}{2}\sqrt{3} \text{ cm}$ b) 6 cm c) 3 cm d) $3\sqrt{3} \text{ cm}$