CBSE Class 10 Maths Notes Chapter 10: Here is a quick overview of circles for students in Class 10. Learn about the notion of the circle by reading the full explanation given here. Discover how to draw a tangent to the circle using a variety of examples and theorems.

Concepts including an introduction to circles, tangents to circles, and the number of tangents from a point on a circle are covered in Class 10 Maths Chapter 10, "Circles."

CBSE Class 10 Maths Notes Chapter 10

Introduction to Circles

As is common knowledge, a circle is a closed, two-dimensional geometric object in which every point on its surface is equally spaced from the point known as its "centre." "Radius" is the measurement of the separation between a circle's centre and any point on its surface.

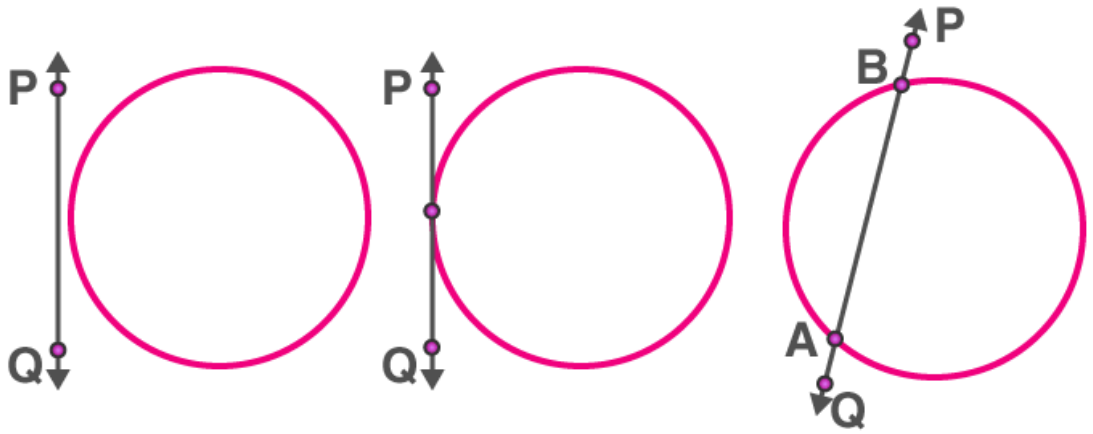
Circle and Line in a Plane

For a circle and a line on a plane, there can be **three** possibilities.

i) they can be **non-intersecting**

ii) they can have **a single common point:** in this case, the line touches the circle.

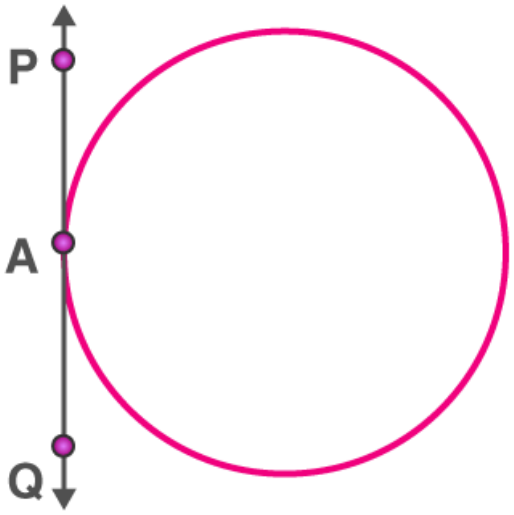
ii) they can have **two common points:** in this case, the line cuts the circle.



(i) Non-intersecting (ii) Touching (iii) Intersecting

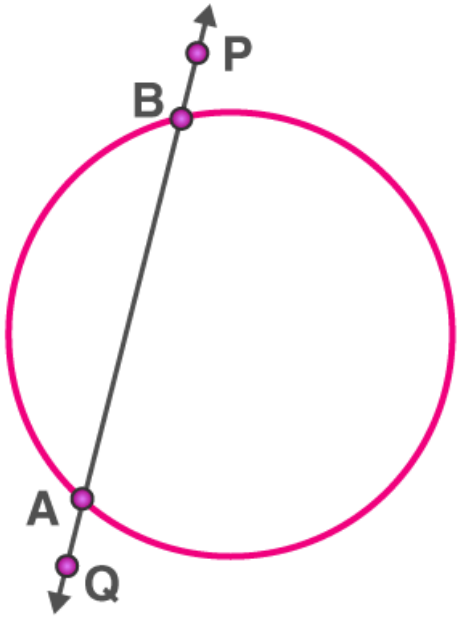
Tangent

A line that touches a circle exactly once is called a tangent. Each point on the circle has a distinct tangent that goes through it.

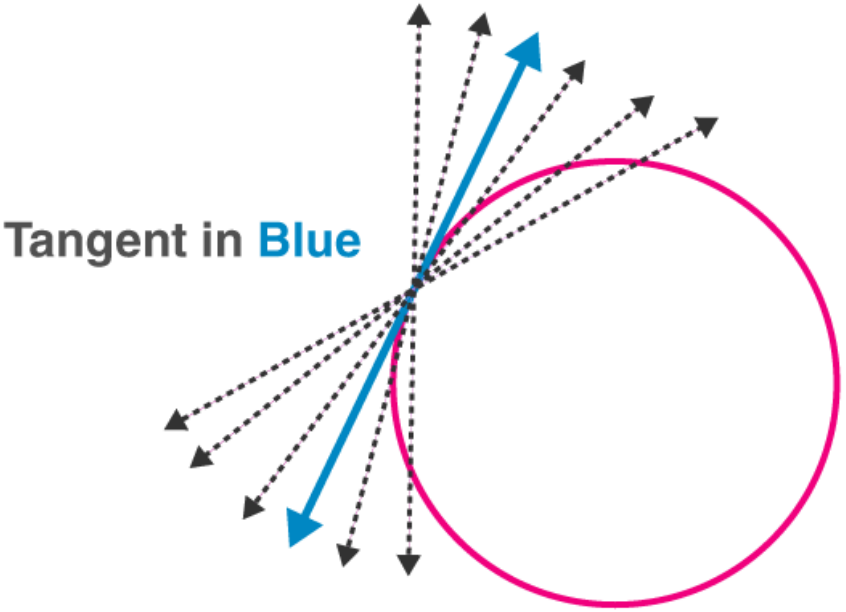


Secant

A line that shares two points with a circle is called a secant to the circle. It creates a chord of the circle by cutting it at two spots.



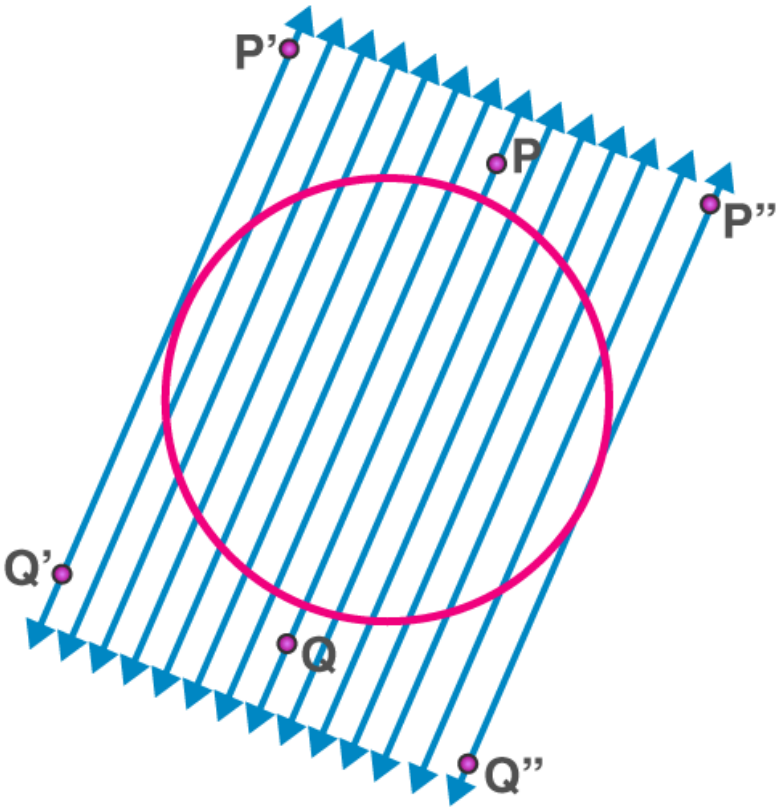
Tangent as a Special Case of Secant



When the two ends of the corresponding chord of a tangent to a circle coincide, the tangent can be thought of as a specific case of the secant.

Two Parallel Tangents at most for a Given Secant

There are precisely two tangents that are parallel to a circle and touch it at two diametrically opposed locations for each secant of a circle.



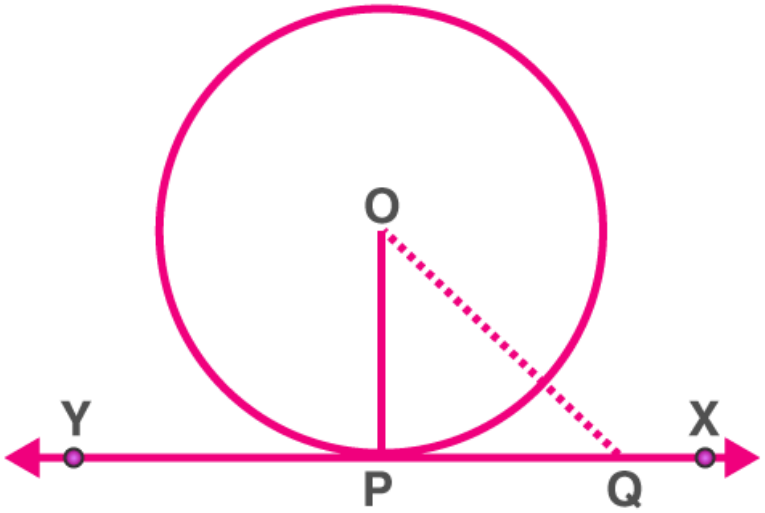
From the given diagram, we can observe the following points:

- PQ is the secant of a circle.
- P'Q' & P"Q" are two tangents which are parallel to PQ.

Theorems

Tangent Perpendicular to the Radius at the Point of Contact

"The tangent to the circle at any point is the perpendicular to the radius of the circle that passes through the point of contact," according to the theorem.



Here, O is the centre and OP ⊥ XY.

Theorem Proof:

Let us consider a circle with centre "O" and tangent XY at point "P." We must now demonstrate that OP is perpendicular to the XY tangent.

Now imagine a point Q different than P on the tangent line XY. As seen in the figure, join the OQ points.

Point Q should be outside the circle in this instance. For XY will not be a tangent to the circle if the point Q is inside the circle. It implies that XY will join a circle as a secant.

So, OQ should be greater than the radius of the circle OP.

It means that

OQ > OP

Since all points on line XY, except P, comply with this requirement, the shortest distance between the centre of the circle "O" and the points on line XY should be found at OP.

As a result, we can say that OP is not parallel to XY.

The theorem is so demonstrated.

The Number of Tangents Drawn from a Given Point

i) Any line passing through the point will be a secant if it is located inside the circle. Therefore, if a circle passes through a point that is inside it, no tangent can be traced to it.

AB is a secant drawn through the point S

ii) When a point of tangency lies on the circle, there is **exactly one tangent** to a circle that passes through it.

iii) When the point lies outside of the circle, there are **accurately two tangents** to a circle through it

Length of a Tangent

The segment of the tangent from the external point P to the point of tangency I with the circle is the length of the tangent from the point (say P) to the circle. The tangent length in this instance is PI.

Benefits of CBSE Class 10 Maths Notes Chapter 10

- Provide concise, understandable descriptions of important ideas.
- Simplifies difficult subjects for easier comprehension.
- Effective study aid for final exam preparation.
- Improves the recall of important information.
- Offers essential points and advice to help with efficient exam preparation.
- Combines information to save time.
- Gives priority to significant subjects and inquiries.
- Provides useful illustrations for linkages to the actual world.
- Increases students' exam-taking confidence.