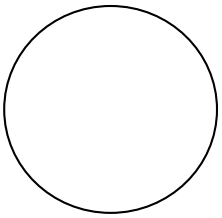
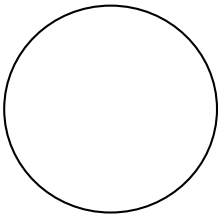
10.4 Notes Notes: _____

Secant and Tangent Lines

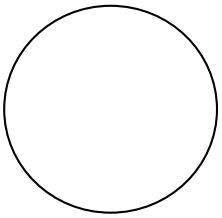
A **secant** is a line that intersects a circle at exactly two points. Every secant contains a _____ of a circle.



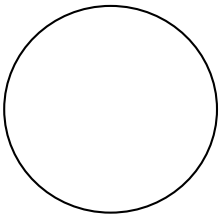
A **tangent** is a line that intersects a circle at exactly one point. This point is called the point of _____ or point of _____.



Postulate A tangent line is perpendicular to the radius drawn to the point of contact.

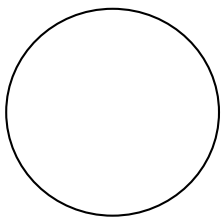


Postulate If a line is perpendicular to a radius at its outer endpoint, then it is tangent to the circle.

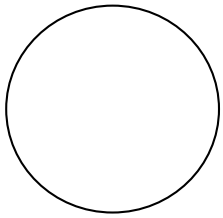


Secant and Tangent Segments

Definition A **tangent segment** is the part of a tangent line between the point of contact and a point outside the circle.

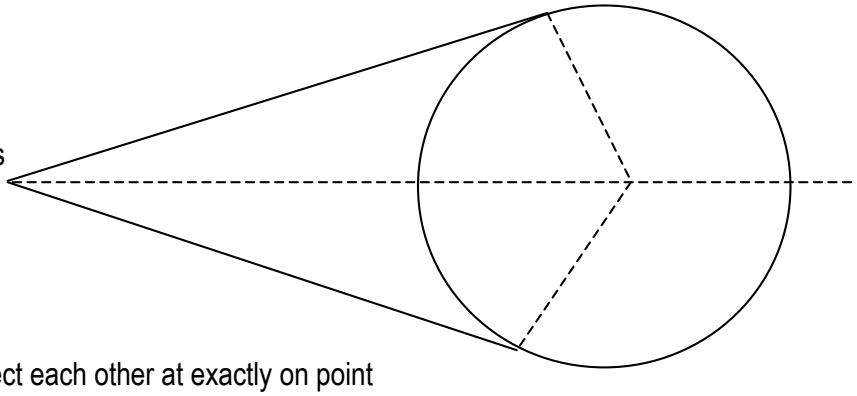


Definition A **secant segment** is the part of the secant line that joins a point outside the circle to the farther intersection point of the secant and the circle. The **external part** of the secant segment is the part of the secant line that joins the outside point to the nearer intersection point.



Theorem **Two Tangent Theorem:** If two tangent segments are drawn to a circle from an external point, then these segments are congruent.

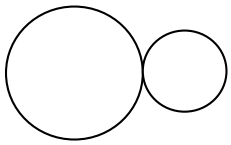
Given: $\odot O$
PX & PY are tangent segments
Then:



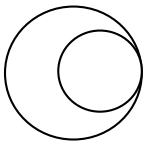
Tangent Circles

Definition **Tangent circles** are circles that intersect each other at exactly on point

Definition Two circles are **externally tangent** if each of the tangent circles lies outside the other.



Definition Two circles are **internally tangent** if each of the tangent circles lies inside the other.



Definition A **common tangent** is a line tangent to two circles, not necessarily at the same point. If a common tangent lies between the circles, it is a **common internal tangent**. If a common tangent is not between the circles, it is a **common external tangent**.

Practice

A walk-around problem:
Given: Each side of a quadrilateral ABCD is tangent to the circle.
AB = 10, BC = 15, AD = 18
Find: CD