

# Activity

Part 1:

1. Use a compass to draw a circle. Label the center  $P$ .
2. Draw lines  $AB$  and  $CB$  so that they intersect circle  $P$  only at  $A$  and  $C$  and intersect each other at point  $B$ .  
  
\*Lines  $AB$  and  $CB$  are tangent to circle  $P$ .
3. Measure segments  $AB$  and  $CB$  and compare their lengths.
4. Repeat 1-3 with 3 different circles comparing the lengths of  $AB$  and  $CB$  for each different circle.

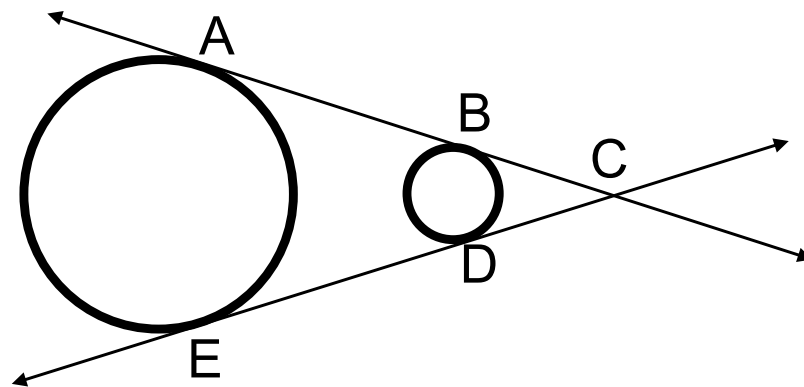
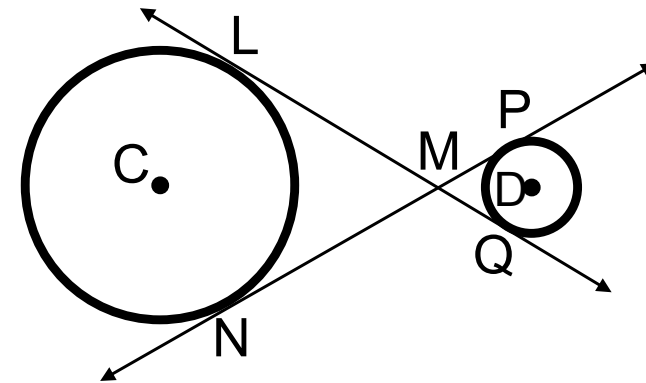
***A Tangent line is a line that intersects a circle at exactly 1 point.***

Part 2:

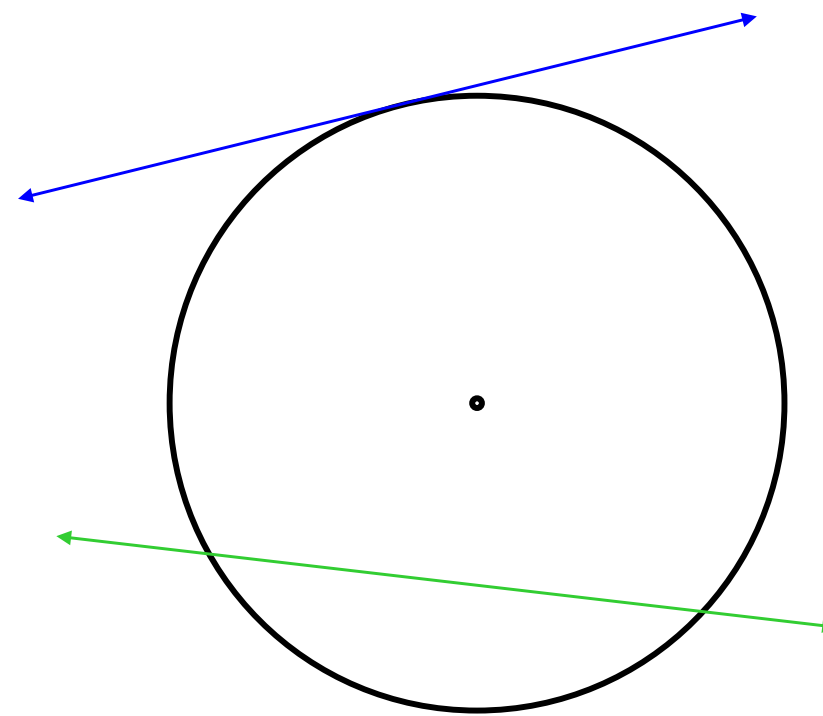
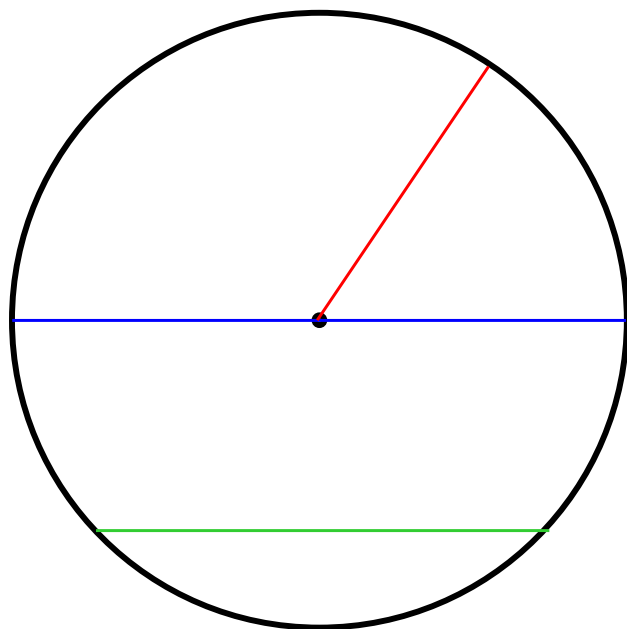
1. Make a conjecture about the lengths of tangent segments that have a common endpoint.

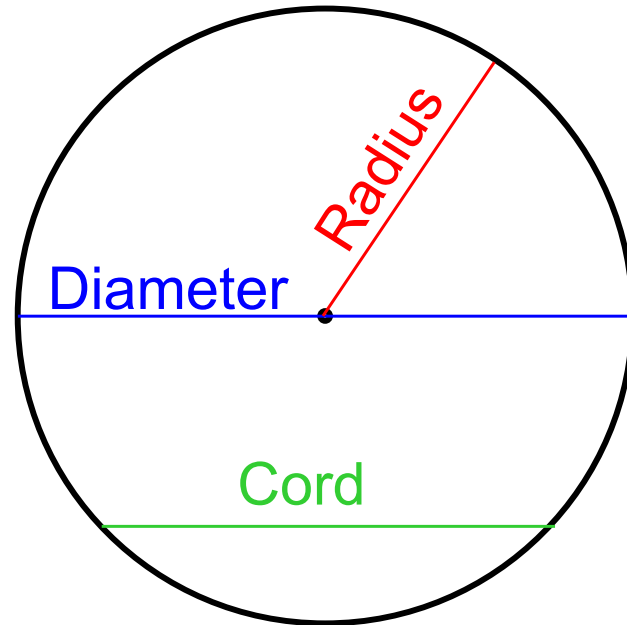
2. In the diagram, L, Q, N, and P, are points of tangency. Use your conjecture from number 1 to find  $LQ$  and  $NP$  if  $LM = 7$  and  $MP = 5.5$

3. In the diagram below, A, B, D, and E are endpoints of tangency. Use your conjecture to explain why AB is congruent to ED.



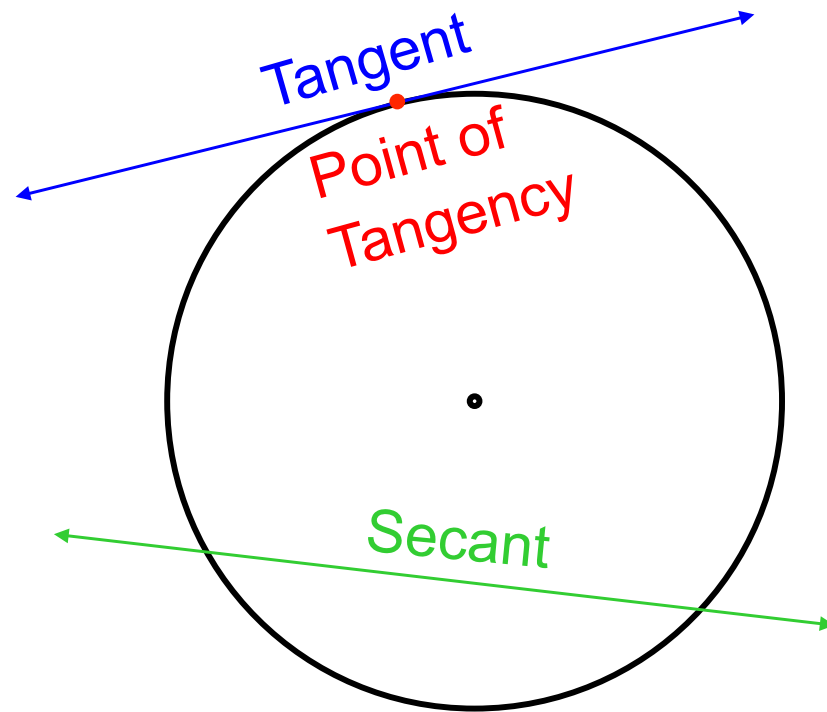
Can we name any of these lines?





Cord: A segment whose endpoints are on a circle

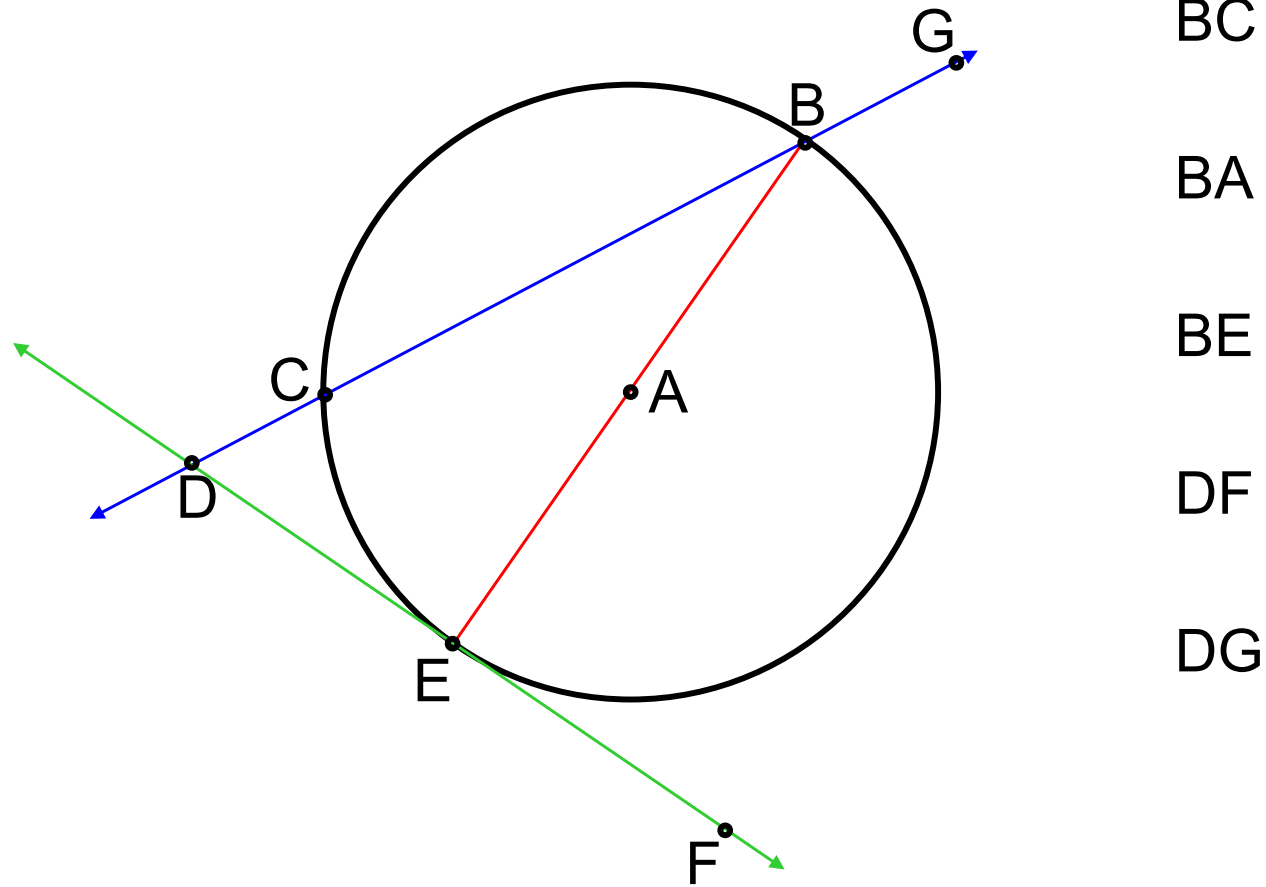
Diameter: A chord that contains the center of a circle



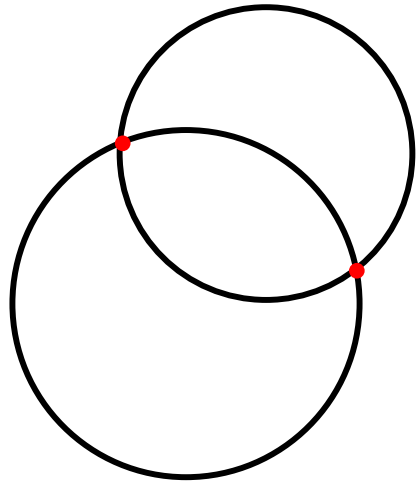
Secant: a line that intersects a circle in two points

Tangent: a line that intersects the circle in exactly 1 point

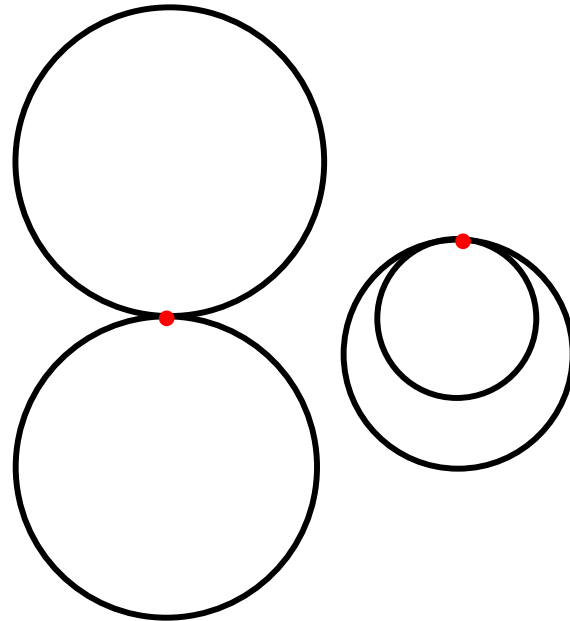
Identify each of the following lines, segments, or rays as either a radius, chord, diameter, secant, or tangent.



# Coplanar Circles

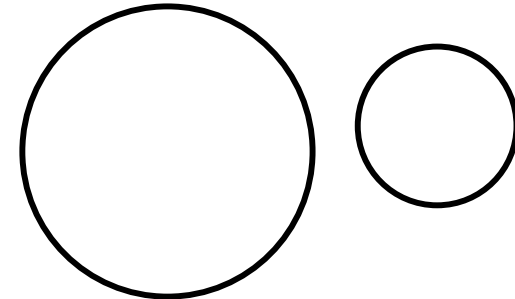


2 points of intersection

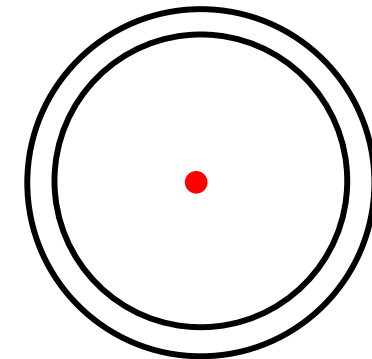


1 point of intersection

*Tangent circles*



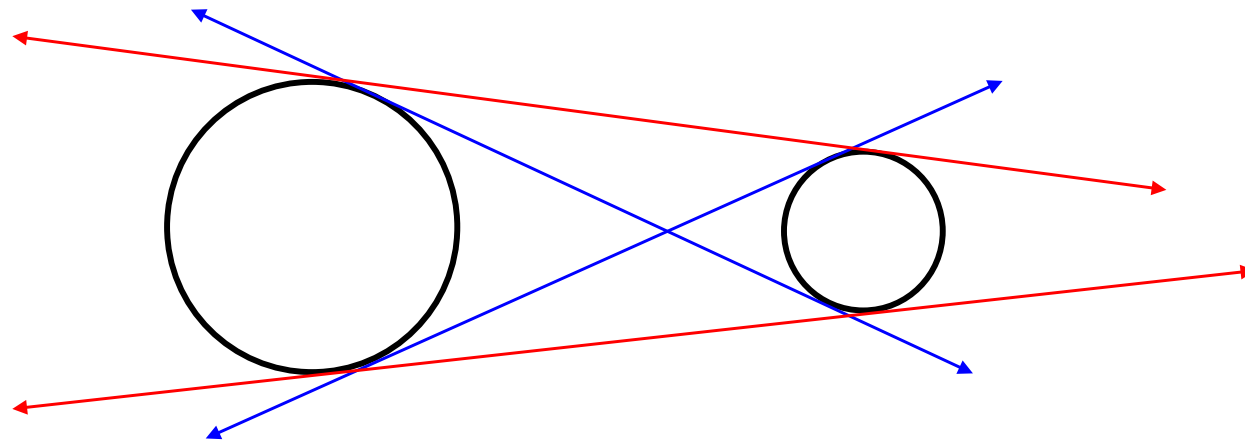
0 points of intersection



Circles with the same center are called  
*Concentric Circles*

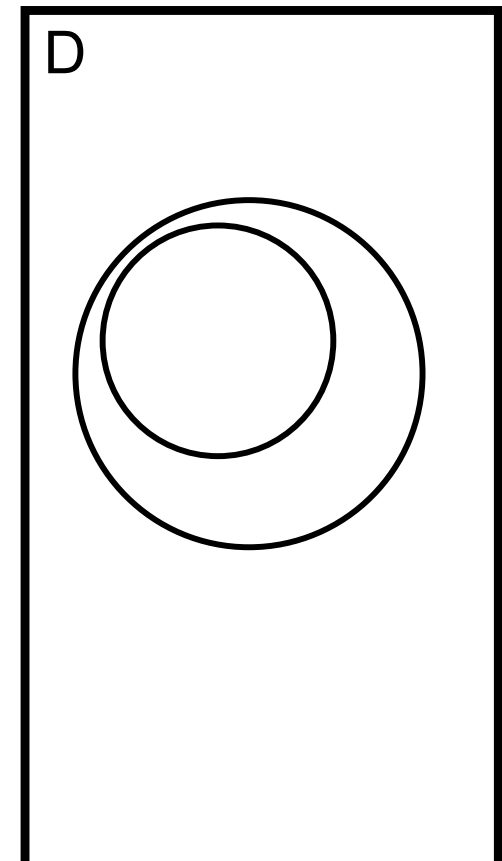
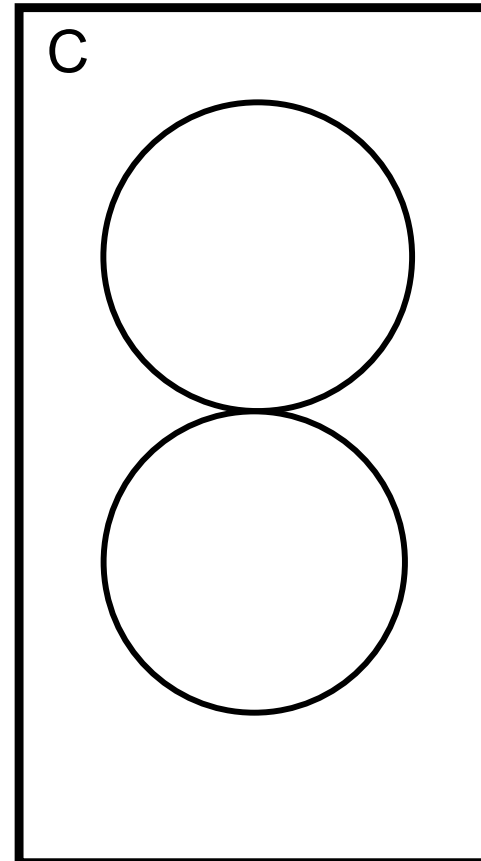
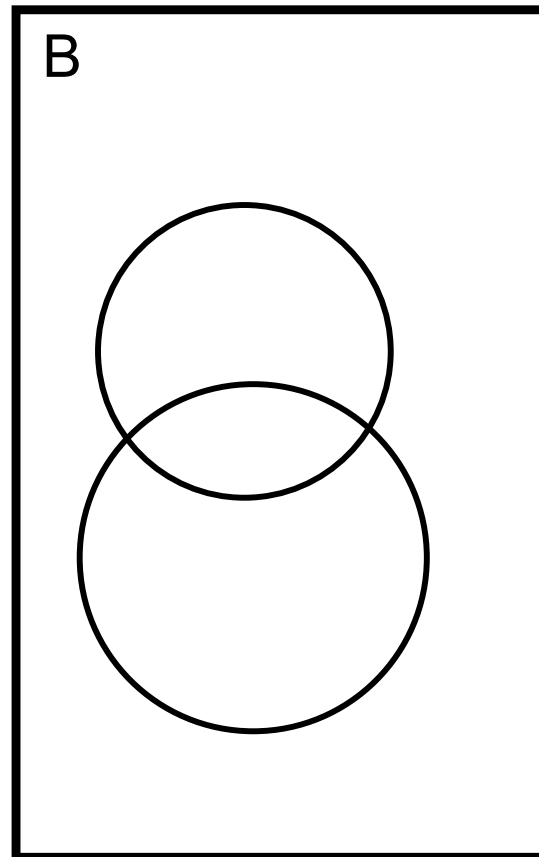
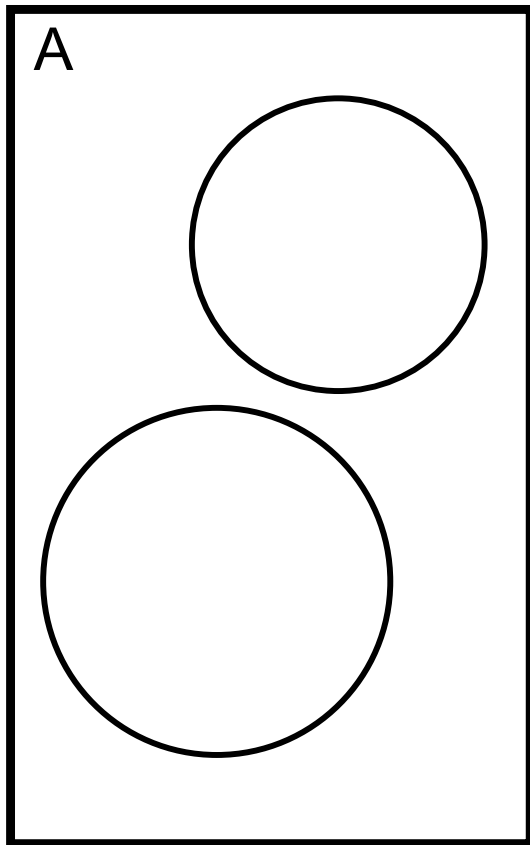
# Common Tangents

A line, ray, or segment that is tangent to two coplanar circles is called a **common tangent**



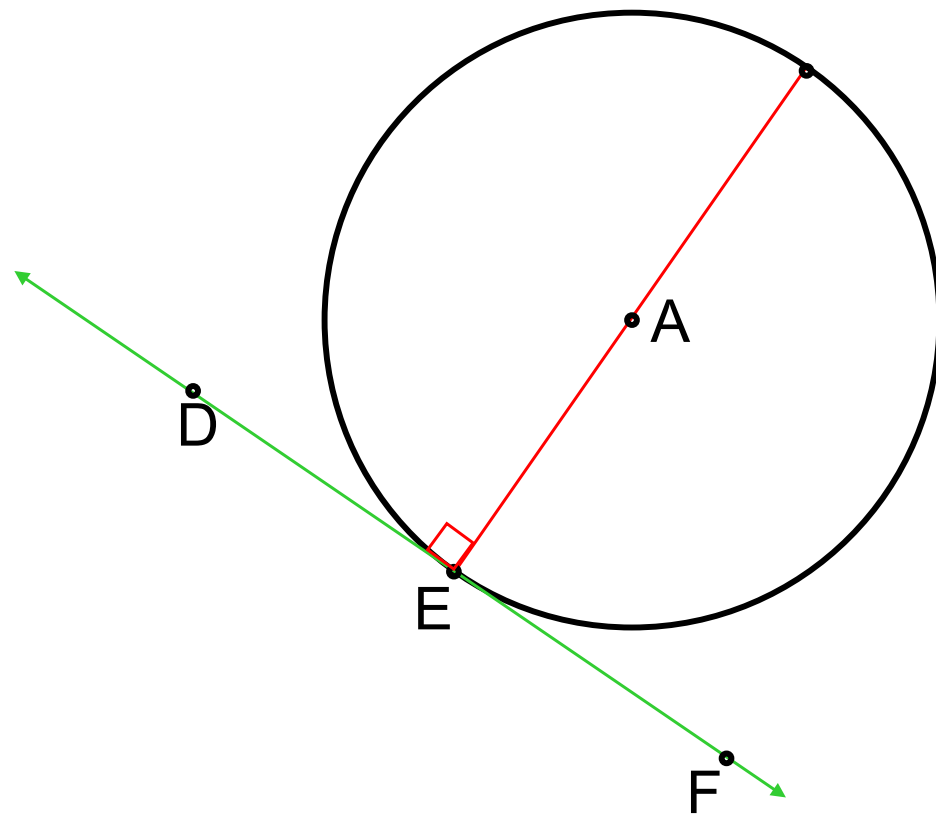


How many common tangents do these circles have?

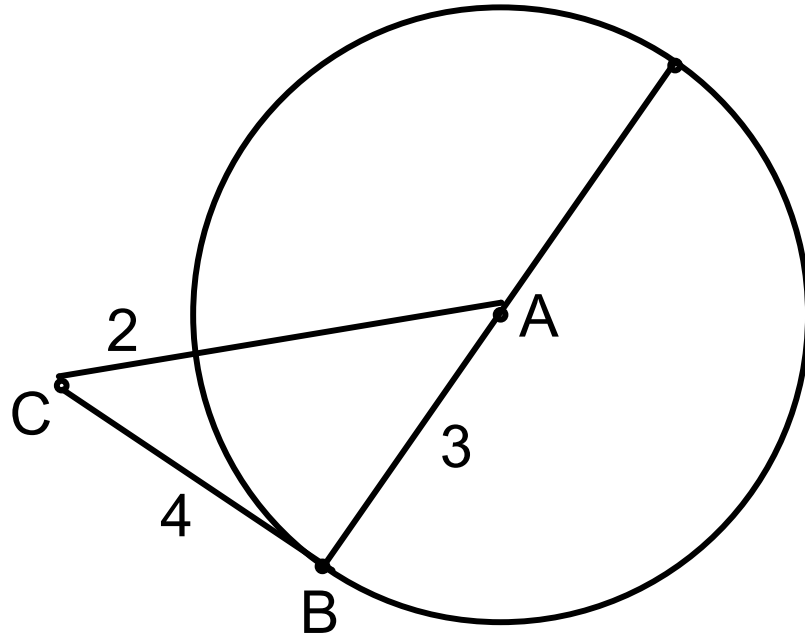


Theorem:

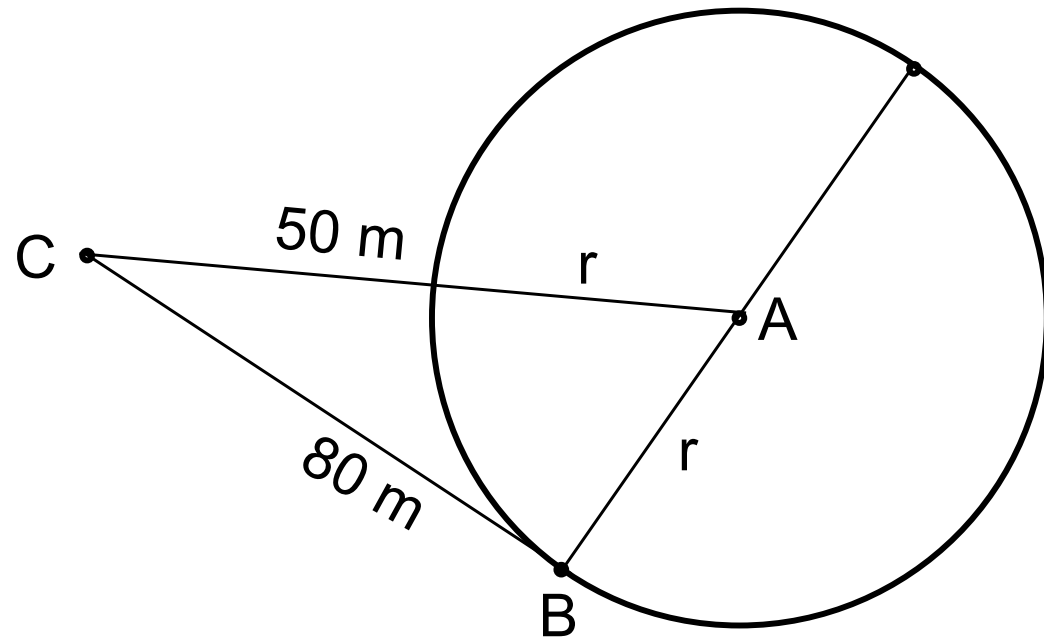
In a plane, a line is tangent to a circle *if and only if* the line is perpendicular to a radius of the circle at its endpoint on the circle.



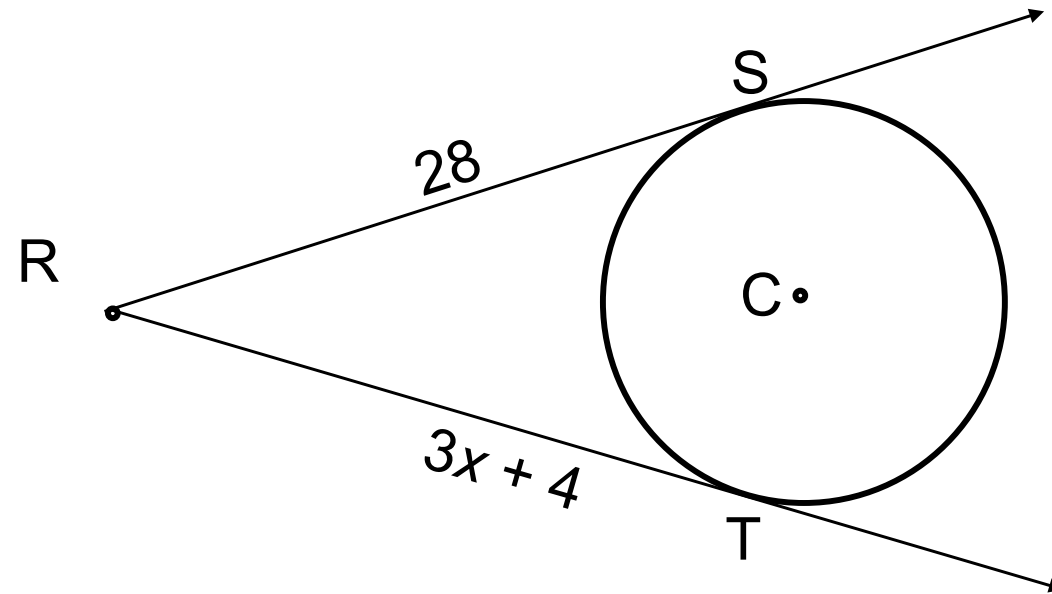
Is CB tangent to circle A?



$B$  is the point of tangency of circle  $A$ . Find the radius,  $r$ , of circle  $A$ .

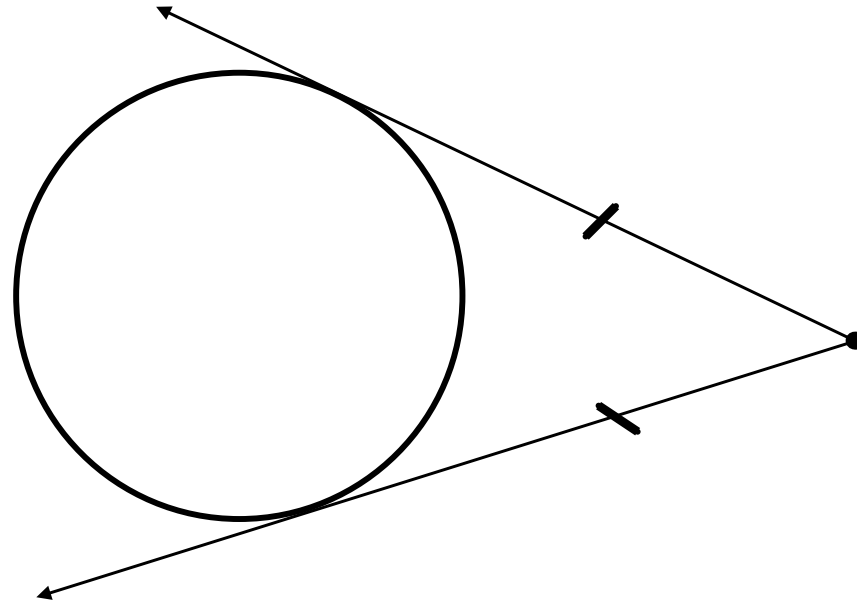


RS is tangent to circle C. Find the value of  $x$

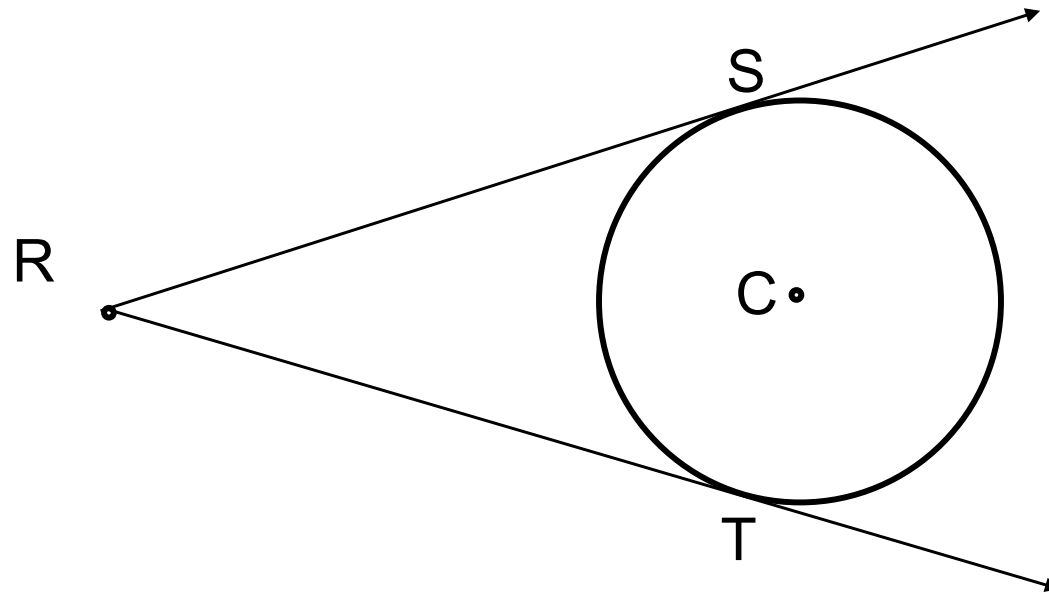


Theorem:

Tangent segments from a common external point are congruent.



Prove that triangle RSC is congruent to triangle RTC.



## **Exit ticket**

Summarize what you learned today.

Review the main ideas of today's class, important ideas we discussed, or anything else that stood out as important to today's class.