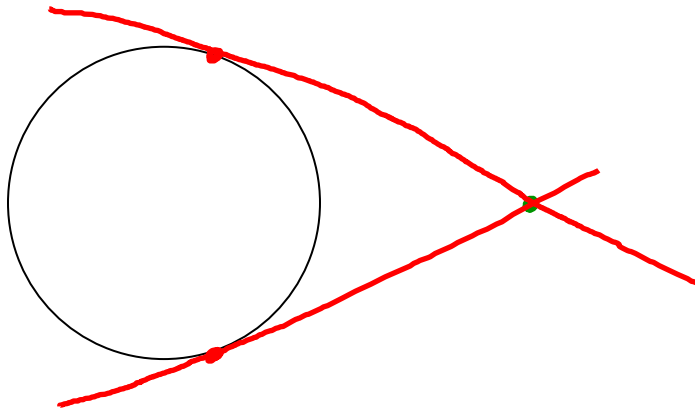# Notes for Lesson 9-2: Tangents

Follow the given steps then answer the questions below:

<u>Step 1:</u> plot a point outside the circle below

<u>Step 2:</u> draw as many tangents to the circle through that point that you can

<u>Step 3:</u> measure the length of each segment from the point to the point of tangency

How many tangents can be made from one point outside the circle?
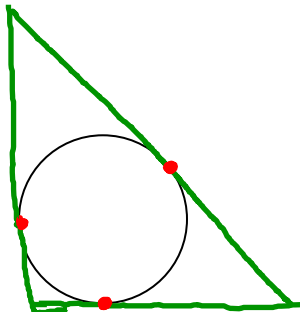
2

What did you notice about the lengths of the segments you measured?
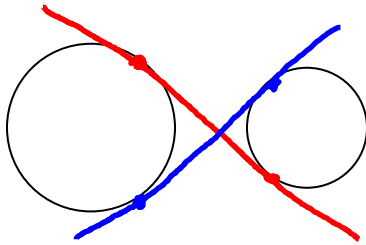
length should be =

<u>Circumscribed polygons:</u> when each side of a polygon is tangent to a circle. Draw a triangle that is circumscribed around the circle below.
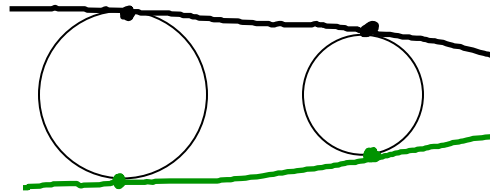
Common tangent: a line that is tangent to two circles in the same plane
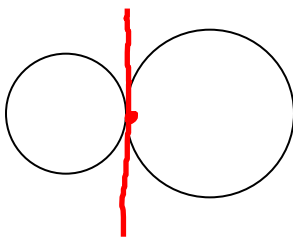
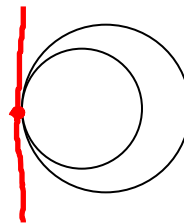**Internal common tangent**

External common tangent

Tangent circles: two or more circles in the same plane that are tangent to the same line at the same point

External tangent circles

Internal tangent circles

Use the theorems, corollaries, and definitions above to solve the following.

Line CB and line CD are tangent to circle O at B and D respectively.

1) If OC = 15 and OB = 9 then BC =

$x^2 + 9^2 = 15^2$

$x = 12$

2) If OB = 12 and BC = 8 then OC =

$8^2 + 12^2 = x^2$

$x = 14.42$

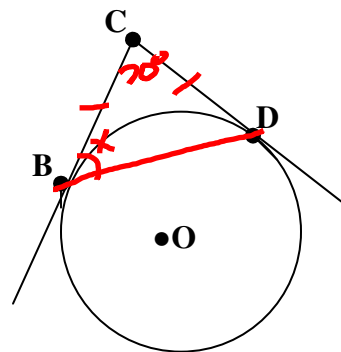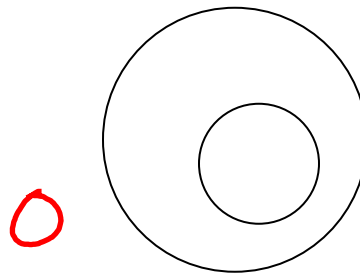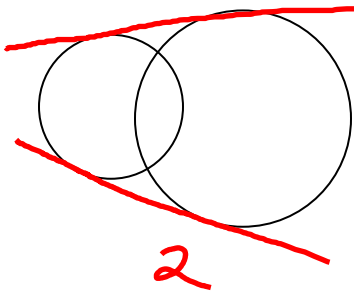3) If m<OCB = 30° and OB = 4 then OC =

$\frac{x}{4} = \frac{2}{1}$ $x = 8$

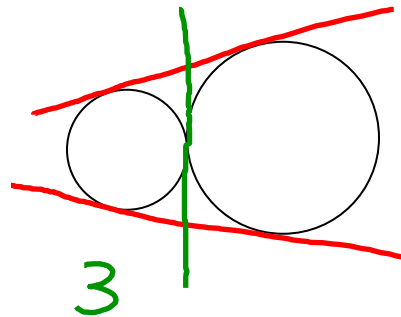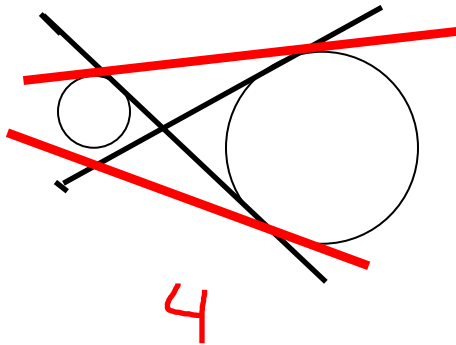4) If m<BCD = 70° then m<CBD = $55°$

For the circles below decide how many common tangents can be drawn to the two circles.

4

3

2

0

Use the diagrams below to solve.

1) Find AC

3 2 1
A *3* B *2* *1* C
8

2) Find SP and RQ

S **24**   **23**R
39{   }**40**
P **15**   **17** Q

3) Find PT and QS

22 *22*

P
S
13 *9*
Q T