MAT 222-840 **Discussion Questions for Chapter 12** Spring 2017

Due: 4/25/17 at 5:00PM

Instructions: Your answers to the following questions do not need to be lengthy or written in complete sentences, but should reflect preparation for our discussion about Chapter 12 at the beginning of class.

Questions:

1. Given any two points on a circle, how many arcs are there between them? How would you describe these arcs?

   Between any two points on a circle, there are two arcs: a minor arc (measures less than 180 degrees) and a major arc (measures greater than 180 degrees). If the two points are endpoints of a diameter, both of the two arcs will be semicircles and will measure 180 degrees.

2. If the arcs $m\,\widehat{AB} = m\,\widehat{RS}$, does this mean that the two arcs are congruent? Why or why not?

   No! If $m\,\widehat{AB} = m\,\widehat{RS}$ and both arcs are in the same circle, or both are in circles of congruent radii, then the two arcs are congruent. However, if the radius of one circle is larger than the other, then the arcs will not be congruent.

3. If two circles do not intersect, how many common tangents do they have? Describe them.

   Warning! There may be more than one answer to this question. Why?

   If two circles do not intersect and one circle is inside the other, they have no common tangents.

   If two circles do not intersect and neither is inside the other, they have four common tangents: one above the circles, one below the circles, and two that cut across diagonally between the circles.

4. If two circles intersect in exactly one place, how many common tangents do they have? Describe them.

   Warning! There may be more than one answer to this question. Why?

   If two circles intersect exactly once and one circle is inside the other, they have one common tangent at the point of intersection.

   If two circles intersect exactly once and neither circle is inside the other, they have three common tangents: one at the point of intersection, one above the circles, and one below the circles.

5. If two circles intersect in exactly two places, how many common tangents do they have? Describe them.

   If two circles intersect in exactly two places, they have two common external tangents, one above the circles and one below.

6. How can you locate the center of any circle?

   Draw any two chords that are not parallel. Use a compass and straight edge to construct their perpendicular bisectors. The intersection point of the two chords is the center.

MAT 222-840 **Discussion Questions for Chapter 12** Spring 2017

Muddiest Point:

What questions do you have about the notes you took in Chapter 12, or anything from this week?

MML Homework Questions:

Are there any MML homework problems from Chapter 12 that you would like to discuss?