Curvature **John Waczak**
MTH 434 Date: January 15, 2018
Dr. Christine Escher

2A

b. Questions

The only part I found confusing in this section was in the derivation of the formula for curvature. On page 25 the author begins by analyzing the reparametrization of the curve $\tilde{\gamma}$. I see how they used the chain and product rules cited in the first two lines but on the third, the author writes:

$$\tilde{\mathbf{a}}^{\perp} = 0 + \phi'(t)^2 \mathbf{a}^{\perp}(\phi(t))$$

I think this step comes from the fact that the velocity vector must point in the direction of the curve and so does not contribute to $\tilde{\mathbf{a}}^{\perp}$. Then the only part left is that $\tilde{\mathbf{a}} = \phi'(t)^2 \mathbf{a}$ and so again, we only care about the perpendicular component leaving us with the above equation that's later used in the derivation of curvature.

c. Reflections

This was a short section so I chose to read through it once without taking notes to get familiar with the material. Then I reread and highlighted important parts and wrote down questions I had. I found the geometric interpretation of fitting a circle to the curve as a way to think about curvature very helpful.

d. Time

It took me approximately half an hour to read through the section two times and take note of everything I thought was important.