Comparing and Contrasting Curves
Dr. Sarah's Differential Geometry

Welcoming Environment: Actively listen to others and encourage everyone to participate! Keep an open mind as you engage in our class activities, explore consensus and employ collective thinking across barriers. Maintain a professional tone, show respect and courtesy, and make your contributions matter.

Try to help each other! Discuss and keep track of any questions your group has. Feel free to ask me questions during group work time as I make my way around as well as when I bring us back together.

1. Sit in a group of 4 (if possible) and introduce yourselves to those sitting near you. What are their preferred first names?

2. Compare and contrast the following curves

   - $\alpha_a(t) = (\cos t, \sin t, t), t \in (0, 2\pi)$
   - $\alpha_b(t) = (\cos 2t, \sin 2t, 2t), t \in (0, \pi)$
   - $\alpha_c(t) = (\cos t, -\sin t, -t), t \in (-2\pi, 0)$
     where $\in$ means element of or inside of

   What can you say about these curves and their similarities and differences? Try to come up with as many perspectives as possible. Discuss and **select a board to write or sketch related information**—try to add items other groups don't already have.

3. Discuss how to compute and the meaning, geometry and physics of:

   (a) $\vec{v} - \vec{w}$

   (b) $\vec{v} + \vec{w}$

   (c) $\vec{v} \cdot \vec{w}$

   (d) $\vec{v} \times \vec{w}$

   (e) $|\vec{v}|$

   (f) $\arccos(\frac{\vec{v} \cdot \vec{w}}{|v||w|})$

   (g) $(\frac{\vec{v} \cdot \vec{w}}{|w||w|})\vec{w}$

4. If finished before I bring us back together, review from the tractrix video—you can access video slides from the "in-class items, video slides and more" page at the top of ASULearn—or look at or discuss upcoming work like practice submitting PDF of by-hand and Maple work or project 1.