This assignment is in three parts. The first part is due at 11:59 PM on Day 1. E-mail me your answers to these eight questions.

1. Expected graduation year:
2. Expected major(s):
3. Home town/state/country:
4. Are you enrolled, waitlisted, or neither?
5. Have you ever studied multivariable calculus before now? Linear algebra?
6. Why do you want to take this course?
7. What special task are you required to perform during the first two weeks of the course?
8. Is there anything else you want to tell me right now?

The second part is due at the start of class on Day 2. It will not be collected, but you are expected to complete these exercises on vectors, just to practice basic skills. If you feel that you need more practice, do more problems, or talk to me.

12.1 #5, 9-14, 18-19, 38-41, 45, 55-56.

The third part is due on paper at the start of class on Day 3. Submit polished solutions, including all necessary work and no unnecessary work, in the order assigned.

A. In this problem, all vectors are in the plane, and their directions are measured clockwise from north. The vector $\vec{v}$ has length 2 and direction 320°. The vector $\vec{w}$ has length 3 and direction 350°. Using the law of sines and the law of cosines (which are in the front of your textbook), compute exactly the length and direction of $\vec{v} + \vec{w}$.

B. 12.1 #57

C. Planets, moons, comets, etc. tend to move in elliptical orbits. But in this problem we are dealing with such a small segment of orbit, that it can be reasonably approximated with a straight line. The units of distance are 10^6 m, measured relative to the Sun, and the units of time are hours. Answer the questions as well as you can. What additional information would you need, to give better answers to the questions?

Suppose that Earth is currently at position $\vec{p} = (212132.00, 212132.00, 0.00)$ and moving with velocity $\vec{v} = \langle 75.66, -75.66, 0\rangle$. Astronomers notice a previously unseen asteroid at position $\vec{q} = (213268.00, 208956.00, 2039.74)$, moving with velocity $\vec{w} = \langle 56.66, 113.32, -169.98\rangle$. Will the asteroid and Earth cross paths? Will the asteroid hit Earth?!