

# Review for Midterm

**Extra office hour: Wednesday 9:30-11:30pm**

## **On Curves (Chapter 1).**

Preparation: Operations on Vectors (inner, cross product).

**Exercise 1**: Using wedge product to write the equation for the plane contain three points which are not on the same line  $P_1(x_1, y_1, z_1)$ ,  $P_2(x_2, y_2, z_2)$  and  $P_3(x_3, y_3, z_3)$ .

Local theory: Frenet trihedron and formula; compute the length, curvature, torsion of a regular curve.

**Exercise 2**: Question 12 on page 25.

**Exercise 3**: Question 3 on page 47.

## **On surface (Chapter 2).**

Basic concepts: Definition of regular surface. Concepts of differentiability

**Exercise 4**: Construct a diffeomorphism between an ellipsoid and a sphere. Prove it is a diffeomorphism.

Simple computation of differential of a map:  $d\psi$ , and normal vector.

**Exercise 5**: Question 11 on page 89.

**WARNING: YOU ARE RESPONSIBLE FOR CHECKING OUT MY TYPOS!**

Comments and question to: [mzhu@math.ou.edu](mailto:mzhu@math.ou.edu)

**@Copyright by Meijun Zhu**