

FUNDAMENTAL CONCEPTS IN DIFFERENTIAL GEOMETRY
FALL 2000
EXERCISE # 1

1. EXERCISES FOR THE PROPER COURSE

1. Send the teacher of this course an e-mail to *drorbn@math.huji.ac.il* and describe your expectations from the course and your impression from the first two classes. Criticism of all kind is welcome.

Please do the same for the TA of this course at *asil@math.huji.ac.il*. You may CC me to Dror's emails if you feel like to.

2. Show that there exists no C^1 one-to-one mapping $f: \mathbb{R}^n \rightarrow \mathbb{R}^m$ for $n > m$.

2. A MINI COURSE ON SURFACES

All the material that I discussed in the class can be found in [1] pp. 1 and in [2] pp. 72–88 and 101–117.

3. Show that $S^2 \subseteq \mathbb{R}^3$ is a surface using two different coordinate systems. Show that the torus T^2 is a surface.

Find the fundamental form of these surfaces. We will discuss these later.

4. Solve questions 27.1-27.3 in [2] (on pp. 85) and question 37.2 on pp. 117.

REFERENCES

- [1] Milnor, Topology From the Differential Viewpoint.
- [2] Kreyszig, Differential Geometry.