

## Math 438, Fall 2003 Homework

### Weeks 13, 14

Reread §4-4 or your notes on this material. Read §4-5, §5-10 through Example 3.

### Assignment 11, due Friday, December 5

§4-4 #5,6,13,15,18

*Hint for #13:* First prove that if there is a parametrization in which the coordinate curves are geodesics,  $K \equiv 0$ . Now that you know that it would be extremely useful to have such a parametrization, use the hypotheses to show that there is one.

If we are well into §4-5 in time, some of §4-5 #1,2,3,4

For #2,3 you will find it useful to remember that  $K = \det dN$  and use the change of variables formula for double integrals, which says that if  $S, S'$  are surfaces and  $\phi : S \rightarrow S' = \phi(S)$  is a diffeomorphism then

$$\iint_{S'} f(u) d\sigma' = \iint_S f(\phi(x))(\det d\phi)(x) d\sigma.$$