Math 501 Spring 2016

Homework 6

Due: Thursday March 3 at the end of class.

(1) Shifrin p. 64 Problem 3

(2) Shifrin p. 65 Problem 13

(3) Shifrin p. 65 Problem 14

(4) Shifrin p. 65 Problem 16

(5) Show that the metric $ds^2 = \frac{du^2+dv^2}{(u^2+v^2+c)^2}$ has constant curvature $4c$.
Show that the metric $ds^2 = \frac{du^2+dv^2}{v^2}$ has constant curvature -1. This is also called hyperbolic space, which we will study in more detail later on.

(6) (Extra Credit)
Show that if $p \in M^2$ and there are 3 lines through p which lie in the surface, then $K(p) = 0$.