

Due: Thursday April 6 at the end of class. A portion of the homework will be graded (by Sam Carp) and returned to you at the end of the next class. Remember to staple your homework and put your name on it.

1. Let S be a regular, orientable, compact surface with positive Gaussian curvature: $K \geq K_0 > 0$. Prove that the surface area of S is less than $\frac{4\pi}{K_0}$.
2. Shifrin Ex. 5, pg. 89
3. Shifrin Ex. 8 (a,b,c,d), pg. 90
4. Let S be the Poincare upper half plane with the metric we defined in class. Identify S with the set of complex numbers $z \in \mathbb{C}$ such that $\text{Im}(z) > 0$ Show that the maps

$$z \rightarrow \frac{az + b}{cz + d}$$

$a, b, c, d \in \mathbb{R}, af - bc > 0$, are isometries of S .