(Math 360) Homework 7:

Due March 5, 2009

All numbered exercises are from Rudin's Principles of Mathematical Analysis.

Exercise 1: Suppose (X, d_X) and (Y, d_Y) are metric spaces. A map $f : (X, d_X) \to (Y, d_Y)$ is an *isometry* if $(\forall x_0, x_1 \in X) d_X(x_0, x_1) = d_Y(f(x_0), f(x_1))$

Prove that if f is an isometry then f is continuous.

Exercise 2: Chapter 4, Exercise 3.

Exercise 3: Chapter 4, Exercise 5.

Exercise 4: Chapter 4, Exercise 11.

Exercise 5: Chapter 4, Exercise 13.

Exercise 6: Chapter 4, Exercise 18.

Exercise 7: Chapter 4, Exercise 20.

Exercise 8: Chapter 4, Exercise 23.

Exercise 9: Chapter 4, Exercise 24.