Do problems 1.2 and 1.3 from Prasolov's book, and the following problems:

1. Prove that $\mathbb{R}^2$ with the taxicab metric is a metric space.

2. Suppose (X, d_1) is a metric space. Define $d_2 : X \times X \to [0, \infty)$ by: $d_2(x, y) = 3d_1(x, y)$. Prove that (X, d_2) is a metric space.