MATH 233, HOMEWORK 4

METRIC SPACES AND GRAPHS

Due by 10 am, Friday, Feb. 22nd

1. HOMEWORK POLICY

You are strongly encouraged to work in groups to exchange ideas and help each other understand how to approach problems, but the work you turn in must be your own! If you work with others on an assignment, be sure to indicate the names of the other students on your homework. Additionally, if you use any outside resources (i.e. internet sources, other mathematicians, other books) to help you solve homework problems, you must cite your sources. Failure to follow these rules will result in a score of zero on an assignment and may constitute a violation of academic integrity.

Homework must be legible, well-organized, and written in complete sentences. Handwritten work is fine, but you are encouraged to type up the problems in LaTeX.

Additional guidelines: If you submit hand written work make sure it is written legibly and stapled. If you submit work through email mail, it must me submitted as a **single pdf file** and have your name on the first page. Failure to follow these guidelines with result in a loss of points.

2. READINGS AND RESPONSES.

(1) Reread Section 2.2.
(2) Read Section 2.3.
(3) Make your own version of Figure 2.1, but for a different graph (whatever you like). You should label the vertices and edges similarly to the labels in Figure 2.1.
(4) Do Exercise 2.3.5

3. PROBLEMS

(1) Write a complete proof of Theorem 2.2.6 to the best of your ability.
(2) Do Exercise 2.3.9
(3) Let $W = \{a, b, c\}$ and $B = \{1, 2, 3, 4\}$. Explicitly write down the edge set for the complete bipartite graph $K(B, W)$. Use the convention that the edge from vertex a to vertex 1 is denoted $\{a, 1\}$.
(4) Let $B = \{1, 2, 3, ..., m\}$ and $W = \{1, 2, 3, ..., n\}$. How many edges are there in the complete graph $K(B)$? How many edges are there in the complete bipartite graph $K(B, W)$? You do not need to prove your answers.