Math 4200-001
Week 2 concepts and homework
1.3-1.4
Due Wednesday September 4 at start of class.

1.3 The first four problems were postponed from the first assignment: 4b, 7a, 8a, 30b. Also, add new problems 25, 31.

1.4 1, 2, 3, 4, 5, 8, 9, 11, 14 (also sketch the sets) 16 (also sketch the sets),18. (18 is the theorem that continuity is equivalent to sequential continuity.) 20, 21.

w2.1
a) Prove that the set in 14b is closed, by showing that its complement is open (directly from the definition of open sets).
b) Prove that the same set is closed, using the generalization of Proposition 1.4.9 which is true for maps from $\mathbb{C}$ to $\mathbb{R}$ or $\mathbb{R}^m$ as well.

w2.2   Prove that if $K \subseteq \mathbb{C}$ is compact, and if $K \subseteq O$, where O is open, then there exists an $\varepsilon > 0$ such that for each $z \in K$, $\mathrm{D}(z; \varepsilon) \subseteq O$. (This is equivalent to Distance Lemma 1.4.21 in the text. See if you can find a proof without looking there first, but in any case write a proof in your own words.)