**373 Math**

**Chapter 6 compactness:**

**From Text book:**

**6-1**: 1,2,3,4,5,6,7,8,11,12,13,14,15 ,18,19,20

**6-2**: 1,2,3,4,5,6,7

Q1: Let be any infinite set with two topologies  and  such that  is a compact space, and . Show that  is compact.

Q2: Let  Is  a compact space.

Q3: Give an example of a compact space which has a non compact subspace.

Q4: Show that Theorem 6.1.21 is not true if X is not compact.

**Chapter 8 Metric Spaces:**

**From Text book:**

8.1: 1, 3, 5, 6, 7, 10, 11.

8.2: 5, 9, 10, 11, 12.

8.3: 2, 3, 4, 5, 8, 9, 14, 15, 16.

8.4: 2(b, c, e, h), 4, 5, 6, 8.

Q1. Give an example to show that for an open bal$B\_{r}\left(y\right)$ in a metric space $\left(X‚d\right)$, it is not true that $Bd\left(B\_{r}\left(y\right)\right)=\left\{x\in X:d\left(x‚y\right)=r\right\}$

Q2. Let $\left(X‚d\right)$ be a metric space and define $e\left(x‚y\right)={d\left(x‚y\right)}/{\left(1+d\left(x‚y\right)\right) }$Prove that e is a bounded metric for X.