Home Work 4 (Quiz on November 18th)

Section 25 Exercises 1, 2, 3
Section 26 Exercises 3, 4, 6, 7
Section 27 Exercises 2, 3, 4
Section 28 Exercises 1, 2, 3
Section 29 Exercises 1, 3, 4, 6.

Home Work 3 (Quiz on October 25th)

Chapter 2 Section 20 Exercises 2, 3, 4, 6, 7
Chapter 2 Section 21 Exercises 1, 2, 4, 6, 10
Chapter 2 Section 22 Exercises 2, 3
Chapter 3 Section 23 Exercises 1, 2, 3, 7, 9, 11
Chapter 3 Section 24 Exercises 2, 3, 5.

Home Work 2 Chapter 2 (Quiz on September 27th)

Sections 12-13 Exercises 2, 3, 4, 6, 8
Sections 14-16 Exercises 2, 3, 4, 6, 8, 9
Section 17 Exercises 2, 3, 5, 6, 9, 11, 13, 18
Section 18 Exercises 2, 4, 5, 6, 10, 12
Section 19 Exercises 2, 5, 7, 8.

Home Work 1 Chapter 1 (Quiz on August 30th)

Section 1 Exercises 2, 10
Section 2 Exercises 2, 5
Section 3 Exercises 5, 6, 12
Section 5 Exercises 1, 4, 5
Section 6 Exercises 2, 5
Section 7 Exercises 1, 3, 4, 5

EXTRA CREDIT:

Credit for *-problems will be given to first 5 persons who will give a correct solution at the board in my office. Then the problem will be removed from the list.

Problem 1*[# of claims left 5](2pts) Show that the space $\mathbb{R}^2 \setminus A$ is connected for any countable set $A$. 
Problem 2*: Suppose that two irregularly shaped pancakes lie on the same platter. Show that it is possible to cut both exactly in half by one stroke of knife.

Problem 3*: Let $B$ be a disjoint family of straight letters $T$ in the plane. Is $B$ necessarily countable?

Problem 4*: What is the maximal number of different sets can be obtained from a subset of the plane by applying successively the interior and the closure operation to the subset in different orders?

Problem 5*: Do there exist three disjoint open subsets in $\mathbb{R}$ that have the same boundary?

Problem 6*: Let $A$ and $B$ be subset of a topological group. If $A$ is closed and $B$ is compact, show that $A \cdot B$ is closed.

Problem 7*: Let $G$ be a connected topological group. Prove that if the topology induced on a normal subgroup $H$ of $G$ is discrete, then $H$ is contained in the center of $G$.

Problem 8*: Let $X^*$ be the quotient space obtained by the partition of $\mathbb{R}$ into singletons and the subset of integers $\mathbb{Z}$. Is $X^*$ metrizable?

Problem 9*: Suppose that function $f$ satisfies the following condition: for every $x \in \mathbb{R}$ there is $k \in \mathbb{N}$ such that $f^{(k)}(x) = 0$.

(A) Prove that there is an interval $[a,b]$ on which $f$ is a polynomial.

(B) Is $f$ a polynomial?