**Real Analysis - Homework 08**

1. Consider the set , i.e. the interval from -1 (included) to 2 (excluded), together with the point {3/1, 5/2, 7/3, 9/4, …}. Is it open or closed or neither? Which points are interior points and boundary points? Which points are isolated and which ones are accumulation points?
2. Are the following sets open, closed, or neither:
   1. Q
   2. N
3. True or false:
   1. If is a collection of closed sets, then is closed
   2. If is a collection of closed sets, then is closed
   3. If *p* is an isolated point of *S* then *p* is a boundary point of *S*
   4. If *x* is an interior point of *S*, then *x* is an accumulation point of *S*
   5. If *x* is a boundary point of *S*, then *x* is an accumulation point of *S*
   6. If *s = sup(S)*, then *s* is an accumulation point of *S*
   7. If *L = lim (an)*, then *L* is an accumulation point of *{an}*
   8. If *s = sup(S)* and *s* is not in *S*, then *s* is an accumulation point of *S*
4. Which sets are compact?
5. Show that if *C* is compact and *F* is closed, then is compact
6. Show that if *C* is compact then *sup(C)* and *inf(C)* both exist and are elements of *C*
7. Find a collection of sets such that each is closed and not empty, , but the intersection of all the is empty.
8. Find a collection of sets such that each is open and not empty, , but the intersection of all is closed and nonempty.