373 Math
Excercises Chapter 3
3.1: 1,2,3,4,5,6,8,9,13,15,16.
3.2: 1,3,4,6,8,9,10,12,13,14,18.

Q1: Let $f:\mathbb{R}\to\mathbb{R}$ be given by $f(x)=\begin{cases} 1 & x\geq 0 \\ -1 & x<0 \end{cases}$

Detemine whether f is
a) $\Im_{co}$ $-\mathcal{U}$ continuous.
b) $\mathcal{U}$ $-\Im_{co}$ continuous.
c) $\Im_1 - \mathcal{U}$ continuous.
d) $\mathcal{U}-\Im_1$ continuous.
e) $\mathcal{C}-\mathcal{C}$ continuous.

Q2: Repeat the previous question for the function $g(x)=x+1$.

3.3: 1,2,3,4,7,8,11,13,14,,15,,20,21,22.

Q3: Let $f:(X,\Im)\to(Y,S)$ be a homeomorphism, $A\subseteq X$. Prove the following
a) If $a\in int(A)$, then $f(a)\in int(f(A))$.
b) f $a\in Bd(A)$, then $f(a)\in Bd(f(A))$.

Q4: Detemine whether $(\mathbb{R},\Im_1)$ and $(\mathbb{R},\mathcal{C})$ are Hausdorff spaces and justify your answer.

Q5:Prove that if $(X,\Im)$ is a Hausdorff space then so is every subspace of X.

Excercises Chapter 4

4.1: 1,2,3,4,5,6,8,11.

Review Exc.: 3,5,13,14

Q1: Detemine whether the set $W=\{(x,y):x>0,|y|\geq 5\}$ is open in
a) $(\mathbb{R},\mathcal{U})\times(\mathbb{R},\mathcal{H})$ open.
b)$(\mathbb{R},\mathcal{H})\times(\mathbb{R},\mathcal{U})$ open.
c)$(\mathbb{R},\mathcal{C})\times(\mathbb{R},\mathcal{C})$ open.