## Homework 2, Math 310, due September 17

(1) Writing truth tables, decide whether the two statements are equivalent or not. $A, B, C$ will denote some mathematical statements.
(a) $A \wedge(B \vee C)$ and $(A \wedge B) \vee(A \wedge C)$.
(b) $A$ and $\neg \neg A$.
(c) $A \Rightarrow B$ and $\neg A \vee B$.
(d) $A \Rightarrow B$ and $A \wedge B$.
(2) If $A, B$ are subsets of $\mathbb{R}$, describe using any of our notations for sets, $A \cap B, A \cup B$ in the following. Choose the simplest (somewhat vague requirement) expression, if possible.
(a) $A=\{x \mid 0 \leq x \leq 10\}$ and $B=\{x \mid-5 \leq x \leq 5\}$.
(b) $A=\left\{x \mid x^{2}<1\right\}$ and $B=\{x \mid x(x-1)<0\}$.
(c) $A=\{x \mid x$ is an integral multiple of $\pi\}$ and $B=\{x \mid(\sin x=$ $0) \wedge(\cos x=1)\}$.

