

MATH 347 HW 1

due September 7, in class

HOMEWORK GUIDLINES

Obviously, your solutions need to be complete and correct, but to receive full credit your write-up should also satisfy the following:

- All the important logical steps in the proof should be present and fully explained.
- All assumptions should be clearly identified.
- Your solutions should be clear and concise. If a sentence does not further the reader's understanding of the solution then it has no place in your write up.
- Use full and grammatically correct English sentences. Mathematical symbols should be used as a tool to distill complex mathematical relationships into a readable format.

Moreover, in order to obtain full credit for the homework, you must write down, in the very least, an attempt at a solution for each problem.

PROBLEMS

Please do the following problems from your book: 1.14, 1.15, 1.27, 1.41 (You do not have to draw Venn diagrams for 1.41) In addition to the problems listed above, please show the following:

- (1) Show that if $X \subseteq Y$, then $\mathcal{P}(X) \subseteq \mathcal{P}(Y)$.
- (2) Show that

$$\mathcal{P}(X) \cap \mathcal{P}(Y) = \mathcal{P}(X \cap Y)$$

and

$$\mathcal{P}(X) \cup \mathcal{P}(Y) \subseteq \mathcal{P}(X \cup Y).$$

Give examples to show that this last containment is generally proper? When can this last containment be an equality?