

* Assignment #4 due Today by 5pm
Assignment #5 due Monday 10/10 by 5pm.

* Exam 1 covers chapters 1, 2, 3 Assignments 1, 2, 3, 4
scheduled for Friday 9/30

You may bring one 8 1/2 x 11 paper of handwritten notes
for the exam.

Quick Summary

Subsets Def $A \subseteq B$ when $(\forall x)(x \in A \rightarrow x \in B)$

To prove that $A \subseteq B$, there are 3 basic strategies.

Direct Proof assume $x \in A$, show $x \in B$

Contrapositive assume $x \notin B$, show $x \notin A$.

Contradiction Assume $x \in A$ and $x \notin B$, find a contradiction.

Implications

To prove that $P \rightarrow Q$, there are 3 basic strategies.

Direct Proof Assume P is true, show Q is true.

Contrapositive Assume Q' is true, show P' is true.

Contradiction Assume $P \wedge Q'$ is true, find a contradiction.

Set equality

To show that $A=B$, show that $A\subseteq B$ and $B\subseteq A$.

Logical Equivalence

To show that $P\leftrightarrow Q$, show that $P\rightarrow Q$ and $Q\rightarrow P$

#5 on Assignment #4

We want to prove that

$$(B-A) \cup A = B \text{ if and only if } A \subseteq B.$$

In order to do this we need to prove

$$(B-A) \cup A = B \text{ implies } A \subseteq B. \text{ Symbolized by } (\rightarrow)$$

$$A \subseteq B \text{ and implies } (B-A) \cup A = B. \text{ Symbolized } (\leftarrow).$$

(\rightarrow) Assume $(B-A) \cup A = B$ and prove $A \subseteq B$.

OR

Assume $A \not\subseteq B$ and prove $(B-A) \cup A \neq B$. ~~I would use this.~~

OR

Assume $(B-A) \cup A = B$ but $A \not\subseteq B$ and find contradiction.

(\leftarrow) Assume $A \subseteq B$ and prove $(B-A) \cup A = B$. ~~I would use this.~~

OR

Assume $(B-A) \cup A \neq B$ and prove $A \not\subseteq B$.

OR

Assume $A \subseteq B$ and $(B-A) \cup A \neq B$ and find a contradiction.

Need to prove
 $(B-A) \cup A \subseteq B$ and
 $B \subseteq (B-A) \cup A$

