

**Lassonde Faculty of Engineering  
EECS**

**MATH1090. Problem Set No. 2**

**Posted: Oct. 7, 2015**

**Due: Oct. 27, 2015, by 2:00pm; in the course  
assignment box.**



It is worth remembering (from the course outline):

The homework must be each individual's own work. While consultations with the instructor, tutor, and among students, are part of the learning process and are encouraged, nevertheless, *at the end of all this consultation* each student will have to produce an individual report rather than a copy (full or partial) of somebody else's report.

“Show that  $\Gamma \vdash A$ ” means write a  $\Gamma$ -proof that establishes  $A$ . The proof can be Equational or Hilbert-style. Equational is rather easier.

The concept of “late assignments” does not exist in this course.



A brief but full justification of each proof step is required!

**Do all the following problems; (5 Points Each).**

1. Show that  $\vdash A \vee B \equiv A \vee \neg B \equiv A$
2. Show that  $\vdash A \wedge (A \vee B) \equiv A$
3. Show that  $\vdash A \vee A \wedge B \equiv A$
4. Show that  $\vdash A \wedge B \vee A \wedge \neg B \equiv A$
5. Show that  $\vdash A \equiv B \equiv (A \wedge B) \vee (\neg A \wedge \neg B)$
6. Show that  $\vdash A \rightarrow (B \rightarrow C) \equiv (A \rightarrow B) \rightarrow (A \rightarrow C)$
7. Show that  $A, B \vdash A \equiv B$
8. Show that  $A, \neg A \vdash \perp$