# CSMM: Lesson 1.3 HW

## Jake Peck

## June 26, 2012

For the following questions, use these function definitions:

$$F := \lambda xy.y$$

$$T := \lambda xy.x$$

$$\neg := \lambda x.xFT$$

$$\wedge := \lambda xy.xyF$$

$$\vee := \lambda xy.xTy$$

(1-8) For each of the following,

Find the normal form of the following $\lambda$-expressions (show work)

1. $\wedge TF$
2. $\wedge FF$
3. $\vee TF$
4. $\vee FF$
5. $\wedge(\vee TF)(\wedge TF)$
6. $\vee(\wedge TT)(\neg(\vee FT))$
7. $T(TFF)(TF(FTF)T)$
8. $\neg(\wedge T(\neg(\wedge F(\vee T(\vee FT)))))$

ANSWERS

Derivations vary, just be careful with parens and variables.

1. $F$
2. $F$
3. $T$
4. $F$
5. $F$
6. $T$
7. $F$
8. $F$