Math 69
Winter 2009
Homework due Monday, February 16

Assigned Monday, February 9:

Section 2.2, problems 14 (also explain why there are 2^{13} definable ternary relations) and 18.

Assigned Tuesday, February 10:

Section 2.4, problems 4 and 11 (also show that if t_1 and t_2 are any terms, then $\{t_1 \approx t_2,\ t_2 \approx t_3\} \vdash t_1 \approx t_3\}$).

Assigned Wednesday, February 11:

Let Σ be any set of formulas, and define a relation on terms by

$$[t_1 \equiv t_2[\iff [\Sigma \vdash t_1 \approx t_2].$$

(1.) Show that $\equiv$ is an equivalence relation

(2.) Let f be a two place function symbol, and define a function on terms by $F(t_1,\ t_2) = ft_1t_2$. Show that F induces a well-defined function on equivalence classes,

$$\mathcal{F}([t_1],\ [t_2]) = [F(t_1,\ t_1)] = [ft_1t_2].$$