

**Homework 5.**

1. Paraphrase the following into quantificational notation. Use the suggested upper case letters for predicates, and lower case letters for names.
  - (a) If Chris is a student at Princeton, then he is a genius. ( $c, P, G$ )
  - (b) If there are wars, then some people are evil. ( $W, P, E$ )
  - (c) Some people are not evil. ( $P, E$ )
  - (d) Nobody is evil. ( $P, E$ ) [Here  $P$  is for people.]
  - (e) If everybody is evil, then Calvin was right. ( $P, E, c, R$ )
  - (f) Either Sarah is admitted to Princeton, or no graduate of Southeast High is admitted to Princeton. ( $s, A, G$ )
  - (g) If all applicants who will be interviewed are college graduates, then some applicants will not be interviewed. ( $A, I, G$ )
  - (h) Some things are round and some things are square, but there are no round squares. ( $R, S$ )
  
2. Show that the following arguments are valid by constructing formal proofs. You may use any of the inference rules from the first half of the semester, as well as Universal Elimination (UE) and Existential Introduction (EI).
  - (a) (1)  $(x)(Fx \rightarrow Gx)$   
 (2)  $\neg Gm \quad / \quad \neg Fm$
  
  - (b) (1)  $(x)(Fx \rightarrow Gx)$   
 (2)  $Fm \quad / \quad (\exists x)Gx$
  
  - (c) (1)  $\neg Fm \quad / \quad \neg (x)Fx$
  
  - (d) (1)  $(x)(Fx \rightarrow Gx) \quad / \quad (y)Fy \rightarrow Gm$

$$(e) (1) \quad (x)Fx \vee (x)Gx \quad / \quad (\exists x)(Fx \vee Gx)$$