

Assignment #11. Due Thurs 4/21.

1. Translate the following into **QL**.

$a \Rightarrow$ Angharad $G \Rightarrow$ __ is a girl
 $b \Rightarrow$ Bryn $F \Rightarrow$ __ speaks Welsh
 $m \Rightarrow$ Mrs. Jones $L \Rightarrow$ __ loves __

- (a) No one except Angharad loves Bryn.
- (b) Some Welsh speaker loves a girl other than Angharad.
- (c) Exactly one girl loves Bryn.
- (d) Exactly two girls love Bryn.
- (e) At most one Welsh speaker loves Bryn.

2. Translate the following into English.

domain = {positive whole numbers}
 $m \Rightarrow 0$ $M \Rightarrow$ __ immediately follows __
 $n \Rightarrow 1$ $R \Rightarrow$ __ equals __ plus __

- (a) $\forall x \forall y \forall z ((Mxz \wedge Myz) \supset x = y)$
- (b) $\neg \exists z Mmz$
- (c) $\forall x \forall y (Rxy \supset x = y)$
- (d) $\forall y \exists x Mxy$
- (e) $\exists x (Rxxx \wedge \forall y (Ryyy \supset y = x))$