

hw5

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8.8

Jim \neq *George*
Spouse(*Jim*, *Laura*)
 $\forall X : X \neq \textit{Jim} \wedge \textit{Spouse}(X, \textit{Laura})$
therefore *Spouse*(*George*, *Laura*)

8.10

a) $\textit{Occupation}(\textit{Emily}, \textit{Surgeon}) \vee \textit{Occupation}(\textit{Emily}, \textit{Lawyer})$
b) $\textit{Occupation}(\textit{Joe}, \textit{Actor}) \wedge \exists! X : X \neq \textit{Actor} \wedge \textit{Occupation}(\textit{Joe}, X)$
c) $\forall X : \textit{Occupation}(X, \textit{Surgeon}) \Rightarrow \textit{Occupation}(X, \textit{Doctor})$
d) $\forall X : \textit{Occupation}(X, \textit{Lawyer}) \Rightarrow \textit{Customer}(\textit{Joe}, X)$
e) $\exists! X : \textit{Boss}(X, \textit{Emily}) \Rightarrow \textit{Occupation}(X, \textit{Lawyer})$
f) $\exists X, \forall Y (\textit{Occupation}(X, \textit{Lawyer}) \Rightarrow (\textit{Customer}(Y, X) \Rightarrow \textit{Occupation}(Y, \textit{Doctor})))$
g) $\forall X, \exists Y : \textit{Occupation}(X, \textit{Surgeon}) \Rightarrow \textit{Customer}(X, Y)$

8.28

b) $\neg \textit{Wrote}(\textit{Gershwin}, \textit{Eleanor Rigby.})$
d) $\exists X : \textit{Wrote}(\textit{Joe}, X)$
g) $\forall X, \exists Y : \textit{Sings}(Y, X, \textit{Revolver}) \Rightarrow Y \neq \textit{Gershwin}$
h) $\forall X, \exists Y : \textit{Wrote}(\textit{Gershwin}, X) \Rightarrow \textit{Sings}(\textit{Gershwin}, X, Y) k) \forall X, \exists Y, \exists Z : \textit{Sings}(\textit{McCartney}, X, Y) \Rightarrow (\textit{CopyOf}(Z, Y) \wedge \textit{Owns}(\textit{Joe}, Z))$