Philosophy 240: Symbolic Logic Fall 2009 Hamilton College Russell Marcus rmarcus1@hamilton.edu

Homework Handout 5: Relational Predicates - Translating to English

Use the following translation key to translate the given	1. (x)[Dx \supset (\exists y)(Yy \cdot Byx)]
formulas into natural English sentences:	2. (x)[(\exists y)(Py · Fxy) \supset (z)(Pz \supset Fxz)]
Ax: x is silver	
Bxy: x belongs to y Cx: x is a cloud	3. (x)[(Rx · Sx) \supset (y)(My \supset ~Gxy)]
Cxy: x keeps company with y	
Dx: x is a dog	4. (x)[(Px · Wx) \supset (y)Uyx]
Ex: x is smoke	
Fx: x is fire Fxy: x is fair for y	5. (x)[(Px \cdot Hxx) \supset Hgx]
g: God	
Gx: x is glass	
Gxy: x gathers y	6. (x)[Hx \supset (y)(Qy \supset ~Lyx)]
Hx: x is home	
Hxy: x helps y Ixy: x is in y	7. (x){Cx \supset (\exists y)[(Ay \cdot Ly) \cdot Byx]}
Jxy: x is judged by y	$f: (X) \{ CX = (\Box y) [(XY = Ly) = DyX] \}$
Kxy: x is a jack of y	
Lx: x is a lining	8. (x)[Px \supset (y)(Cxy \supset Jxy)]
Lxy: x is like y	
Mx: x is moss	
Mxy: x is master of y	9. (x){Qx \supset [(\exists y)(Ey \cdot Iyx) \supset (\exists z)(Fz \cdot Izx)]}
Px: x is a person Qx: x is a place	
Rx: x rolls	10. (x){[Px · (y)(Ty \supset Kxy)] \supset (z)(Tz \supset \sim Mxz)}
Sx: x is a stone	10. (x) ([1x (y)(1y - 10xy)] - (2)(12 - 10x2))
Tx: x is a trade	
Txy: x should throw y	11. (x){{ $Px \cdot (\exists y)[(Gy \cdot Uy) \cdot Ixy]$ } $\supset (z)(Sz \supset \neg Txz)$ }
Ux: x is a house	
Uxy: x comes to y	$12 (-) ([D_{-}, (-), V_{-}], (-), C_{-})$
Vxy: x ventures y Wx: x waits	12. (x){[Px \cdot (y)~Vxy] \supset (z)~Gxz}
Yx: x is a day	
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Adapted from Copi, Symbolic Logic, 5th ed., MacMillan Publ., 1979.