Sample Solutions to Homework Handout 3: Relational Predicates - Translating to English

Use the following translation key to translate the given formulas into natural English sentences:

Ax: x is silver
Bxy: x belongs to y
Cx: x is a cloud
Cxy: x keeps company with y
Dx: x is a dog
Ex: x is smoke
Fx: x is fire
Fxy: x is fair for y
g: God
Gx: x is glass
Gxy: x gathers y
Hx: x is home
Hxy: x helps y
Ixy: x is in y
Jxy: x is judged by y
Kxy: x is a jack of y
Lx: x is a lining
Lxy: x is like y
Mx: x is moss
Mxy: x is master of y
Px: x is a person
Qx: x is a place
Rx: x rolls
Sx: x is a stone
Tx: x is a trade
Txy: x should throw y
Ux: x is a house
Uxy: x comes to y
Vxy: x ventures y
Wx: x waits
Yx: x is a day

1. (x)[Dx ⊃ (∃y)(Yy · Byx)]
    Every dog has its day.

2. (x)[(∃y)(Py · Fxy) ⊃ (z)(Pz ⊃ Fxz)]
    What's fair for one is fair for all.

3. (x)[(Rx · Sx) ⊃ (y)(My ⊃ ~Gxy)]
    Rolling stones gather no moss.

4. (x)[(Px · Wx) ⊃ (y)Uyx]
    Everything comes to those who wait.

5. (x)[(Px · Hxx) ⊃ Hgx]
    God helps those who help themselves.

6. (x)[Hx ⊃ (y)(Qy ⊃ ~Lyx)]
    There is no place like home.

7. (x){Cx ⊃ (∃y)[(Ay · Ly) · Byx]}
    Every cloud has a silver lining.

8. (x)[Px ⊃ (y)(Cxy ⊃ Jxy)]
    A person is judged by the company (s)he keeps.

9. (x){Qx ⊃ [(∃y)(Ey · Iyx) ⊃ (∃z)(Fz · Izx)]}
    Where there's smoke, there's fire.

10. (x){[Px · (y)(Ty ⊃ Kxy)] ⊃ (z)(Tz ⊃ ~Mxz)}
    A jack of all trades is a master of none.

11. (x){{Px · (∃y)[(Gy · Uy) · Ixy]} ⊃ (z)(Sz ⊃ ~Txz)}
    People who live in glass houses shouldn't throw stones.

12. (x){[Px · (y)~Vxy] ⊃ (z)~Gxz}
    Nothing ventured, nothing gained.