Section 7.7E

1. b. ~ (∃x)(Px & Hx)
d. (∃x)(Px & ~ Hx)
f. (∃y)[(Py & Hy) & Dy]
h. ~ (∃z)(Iz & Hz)
j. (∃z)(Rz & Hz) & ~ (∀z)(Rz ⊃ Hz)
l. (∀x)[Ix ⊃ (Px ∨ Rx)]
n. ~ Ih & (Ph & Hh)
p. (∀w)Pw & ~ (∀y)Hy
r. (∃w)[(Pw & Iw) & Hw] & ~ (∃w)[(Pw & Iw) & Lw]

2. b. (∀z)(Lz ⊃ Fz)
d. (∃x)(Lx & Cxd)
f. (∀x)[(Lx & Fx) ⊃ Bx]
h. (∃x)(Lx & Cxd) & (∃x)(Tx & Cxd)
j. (∀z)([(Lz ∨ Tz) & Fz] ⊃ Bz)
l. Bd & (∀x)([(Lx ∨ Tx) & Fx] ⊃ Bx)
n. (∀y)[Ly ⊃ (Fy ≡ Cdy)]
p. Fd ⊃ (∀z)(Lz ⊃ Tz)

3. b. ~ (∃x)(Ex & Yx)
d. (∃y)(Ey & Yy) & (∃y)(Ey & ~ Yy)
f. (∀y)[(Ey & ~ Yy) ⊃ ~ Iy]
h. (∃x)(Ex & Sx) ⊃ Sf
j. ~ (∃y)(Yy & ~ Iy)
l. (Yf ⊃ ~ Pf) & (Pf ⊃ ~ If)
n. ~ (∃z)[(Pz & Rzz) & Yz]
p. (∀x)([Ex ∨ Lx) & Ix] ⊃ Rxx)
r. (∀z)([Yz & (Ez ∨ Lz)] ⊃ Rzz)
t. (∃x)[(Yx & Lx) & (Ex & Nx)]

4. b. (∀y)[(Py & Oy) ⊃ Uy]
d. (∀z)[Az ⊃ ~ (Oz ∨ Uz)] & (∀x)[Px ⊃ (Ux & Ox)]
f. [(∃x)(Ax & Ux) ⊃ (∀x)(Px ⊃ Ux)] &
[(∃y)(Py & Uy) ⊃ (∀w)(Sw ⊃ Uw)]
h. ((∀w)[Aw ⊃ (Ow & ~ Uw)] & (∀y)[Sy ⊃ (Uy & ~ Oy)]) &
(∀z)[Pz ⊃ (Oz & Uz)]
j. ((∃x)[Px & (Ux & Sx)] & (∃x)[Ax & (Ox & Px)]) &
~ (∃x)(Ax & Sx)

5. b. Neither one nor four is prime.
d. No integer is both even and odd.
f. One is the smallest positive integer.
h. Every prime is larger than one.
j. No integer is both odd and evenly divisible by two.
l. Not every integer is evenly divisible by two.

n. Each integer is such that if it is evenly divisible by two then it is not evenly divisible by three.

p. There is an integer that is both prime and evenly divisible by two.

r. Every prime is larger than one.

Section 7.8E

1. b. (∃y)[Sy & (Cy & ~ Ly)]
d. (∀x)(([Sx & Cx] & ~ Lx) ⊃ Yx)
f. ~ (∀z)[(∃x)(Sx & Dzx) ⊃ Sz]
h. (∀y)[(Sy & (~ Ly & Cy)) ⊃ ~ (∃x)(Dxy ∨ Sxy)]
j. (∀w)[(Sw & [(∃x)Dxy & (∃x)Sxy]) ⊃ Lw]
l. (∀x)[Wx ⊃ (Sx ∨ (∃y)[(Dxy ∨ Sxy) & Sy])]

2. b. (∃x)[Ax & (∀y)(Fy ⊃ Exy)] ⊃ (∀y)(Fy ⊃ Ejy)
d. (∀y)[(Ay & (∀x)(Fx ⊃ Eyx)) ⊃ Ry]
f. ~ (∀w)(Fw ⊃ Uw) & (∀w)(Uw ⊃ Fw)
h. (∀x)[(Fx & Ax) ⊃ (∃y)[(Fy & ~ Ay) & Exy]]
j. (∀y)((Fy & My) ⊃ (∀x)[(Fx & ~ Mx) ⊃ Eyx])
l. (∃x)[(Ax & Fx) & (∀y)[(Ay & ~ Fy) ⊃ Dxy]]
n. (∀x)(∃y)Dxy & (∀x)[(∀y)Dxy ⊃ (Ax & ~ Fx)]

3. b. (∀y)[(Py & (∀z)(Szy ⊃ Byz)) ⊃ Dy]
d. (∀y)(Py ⊃ (∀z)[Szy ⊃ (Byz ≡ Bzy)])
f. (∀x)(∀y)([(Py & Sxy) & Byx] ⊃ (Wy & Wx))
h. ~ (∃x)[Px & (∀y)Nxy]
j. (∀x)[(Px & Ux) ⊃ (∀y)[Syx ⊃ (Bxy ∨ Gxy)]]
l. (∀x)(∀y)([(Py & Sxy) & ~ Lyx] ⊃ Wx)
n. (∃z)(Pz & ~ Nzt)
p. ~ (∃w)[(Pw & Nwt) & (∃y)(Syw & Bwy)]

4. b. Hildegard loves Manfred whenever Manfred loves Hildegard.
d. Siegfried always loves Hildegard.
f. Everyone is unloved at some time.
h. At every time someone is unloved.
j. At every time someone loves someone.
l. Everybody loves somebody sometime.
n. Someone always loves everyone.

5. b. The product of odd integers is odd.
d. Any prime that is larger than a prime is odd.
f. The product of primes, both of which are larger than two, is odd.
h. There is an even prime.
j. No integer is larger than every integer and for every integer there is an integer larger than it.