Philosophy 240: Symbolic Logic
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Some Practice Problems for Test #5

I. Derivations.

1. 1. Ab ∨ Bc
   2. (x)~Bx / (∃x)Ax

2. 1. (x)(Rx ⊃ Ox)
   2. (∃x)~Ox
   3. (x)(~Rx ⊃ Px) / (∃x)Px

3. 1. (x)(Fx ⊃ Gx)
   2. (y)(Gy ⊃ Hy) / (z)(~Hz ⊃ ~Fz)

4. 1. (∃x)(Ax · Bx) ⊃ (x) Dx
   2. ~Da / (x)(Ax ⊃ ~Bx)

5. 1. (y)[Ay ⊃ (~By ⊃ Dy)]
   2. ~Ba / Aa ⊃ Da

6. 1. (x)(Qx ⊃ ~Px) / (∃x)Px ⊃ ~(x)Qx

7. 1. (x)[Ax ⊃ (Bx · Dx)]
   2. (x)[(Ax · Dx) ⊃ Ex]
   3. (x)(Ex ⊃ ~Dx) / ~Aa

8. 1. (x)(Ax ⊃ Bx)
   2. (x)[Bx ⊃ (Ax ⊃ ~Fx)]
   3. (x)[(~Cx · Dx) ⊃ Fx] / (x)[Ax ⊃ (Cx ∨ ~Dx)]

9. 1. (∃x)Gx ⊃ (x)(Fx ⊃ Dx)
   2. (∃x)(Gx · ~Dx) / ~(x)Fx

10. 1. (∃x)Qx ⊃ (x)(Rx ⊃ Sx)
    2. (x)~Qx ⊃ (∃x)Sx
    3. (x) Rx / (∃x)Sx

II. Invalidity. Demonstrate the invalidity of each of the following arguments. Provide a counterexample.

1. 1. (∃x)(Ax · ~Bx)
   2. (x)(Bx ⊃ Cx) / (∃x)(Ax · Cx)

2. 1. (x)(Fx ⊃ Gx)
   2. (∃x)Fx / (x)(~Gx ⊃ ~Ex)

3. 1. (x)[(Px · Qx) ⊃ Rx]
   2. (∃x)(Qx · ~Rx)
   3. (∃x)(Px · ~Rx) / (∃x)(~Px · ~Qx)