

Problem 1

1. $\neg\neg\exists x\neg F(x)$ AS for CP
2. $\neg F(c)$ AS for IP
3. $\exists x\neg F(x)$ EG 2
4. $\neg\exists x\neg F(x) \wedge \exists x\neg F(x)$ CONJ 1, 3
5. $\neg\neg F(c)$ IP 2-4
6. $F(c)$ DNE 5
7. $\forall x F(x)$ UG 7
8. $\neg\exists x\neg F(x) \rightarrow \forall x F(x)$ CP 1-7

Problem 2

1. $\exists x(F(x) \rightarrow p)$ AS for CP
2. $F(c) \rightarrow p$ AS for CP
3. $\neg F(c) \vee p$ CE 2
4. $\forall x F(x)$ AS for CP
5. $F(c)$ UI 4
6. p DS 5,3
7. $\forall x(F(x) \rightarrow p)$ CP 4-6
8. $\forall x(F(x) \rightarrow p)$ EI 2-7
9. $\exists x(F(x) \rightarrow p) \rightarrow \forall x(F(x) \rightarrow p)$ CP 1-8
10. $\forall x(F(x) \rightarrow p)$ AS for CP
11. $F(c) \rightarrow p$ UI 10
12. $\exists x(F(x) \rightarrow p)$ EG 11
13. $[\forall x F(x) \rightarrow p] \rightarrow \exists x(F(x) \rightarrow p)$ CP 10-12
14. $[\exists x(F(x) \rightarrow p)] \iff [\forall x F(x) \rightarrow p]$ BE 9,13