2. (15%) Given P1: $(\forall x)(\forall y)((P(x) \wedge Q(y)) \Rightarrow R(x,y))$

P2: $(\exists x)(\forall y)((P(x) \wedge S(x,y)) \Rightarrow Q(y))$

P3: $(\forall x)(\exists y)(P(x) \wedge \sim R(x,y) \wedge T(x,y))$

C: $(\exists x)(\exists y)(P(x) \wedge \sim S(x,y) \wedge T(x,y))$

Prove that P1, P2, P3 $\vdash$ C.