3. (30%) Prove that P1, P2, P3 $\vdash C$.

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