

Delvise løsningsforslag til gamle eksamensspørsmål

EN

Vi setter opp et bevis (i ND1750) for $((P \rightarrow R) \wedge (Q \rightarrow R)) \rightarrow ((P \vee Q) \rightarrow R)$.

| | | |
|---|---|-----------|
| 1 | $(P \rightarrow R) \wedge (Q \rightarrow R)$ | P |
| 2 | $P \rightarrow R$ | 1, Simp |
| 3 | $Q \rightarrow R$ | 1, Simp |
| 4 | $P \vee Q$ | P |
| 5 | $R \vee R$ | 4,2,3, CD |
| 6 | R | 5, Contr |
| 7 | $(P \vee Q) \rightarrow R$ | 4,6, CP |
| 8 | $((P \rightarrow R) \wedge (Q \rightarrow R)) \rightarrow ((P \vee Q) \rightarrow R)$ | 1,7, CP |

TO

- $\forall x(\text{epost}(x) \rightarrow \exists y(\text{sendt}(y, x) \wedge \forall z(\text{sendt}(z, x) \rightarrow y = z))) \wedge \exists y \text{mottatt}(y, x)$
- $\exists x(\text{epost}(x) \wedge \text{sendt}(\text{per}, x)) \wedge \exists x(\text{epost}(x) \wedge \text{mottatt}(\text{per}, x)) \wedge \neg \exists x(\text{epost}(x) \wedge \text{sendt}(\text{per}, x) \wedge \text{mottatt}(\text{per}, x))$

TRE

Vi setter opp et bevis (i ND1750PRED) for $\forall x \exists y (P(x) \vee P(y)) \rightarrow \exists x P(x)$.

| | | |
|----|---|-----------|
| 1 | $\forall x \exists y (P(x) \vee P(y))$ | P |
| 2 | $\exists y (P(a) \vee P(y))$ | 1, UI |
| 3 | $P(a) \vee P(b)$ | 2, EI |
| 4 | $P(a)$ | P |
| 5 | $\exists x P(x)$ | 4, EG |
| 6 | $P(a) \rightarrow \exists x P(x)$ | 4,5, CP |
| 7 | $P(b)$ | P |
| 8 | $\exists x P(x)$ | 7, EG |
| 9 | $P(b) \rightarrow \exists x P(x)$ | 7,8, CP |
| 10 | $\exists x P(x) \vee \exists x P(x)$ | 3,7,9, CD |
| 11 | $\exists x P(x)$ | 11, Contr |
| 12 | $\forall x \exists y (P(x) \vee P(y)) \rightarrow \exists x P(x)$ | 1,12 CP |