

1. Symbolization

(a) $\forall x(\Box Fx \rightarrow \Diamond \Box Fx)$

(b) $(\forall x \Box Mx) \rightarrow (\exists x \Diamond Mx)$ (Mx: x is material)

(c) $\exists x[Tx \wedge \neg \exists y(Ty \wedge Fyx) \wedge \exists z(Tz \wedge \Diamond Fzx \wedge x \neq z)]$

There is somebody on the team that nobody is faster than. However there is a distinct person on the team who might have been faster than said fastest person on the team

(d) $\exists x[Tx \wedge \neg \exists y(Ty \wedge Fyx) \wedge \exists z(\neg \exists \alpha[T\alpha \wedge Fz\alpha] \wedge \Diamond Fzx)]$

There is some x who is on the team who nobody is faster than. There is some z on the team that nobody is slower than. It is possible that z was faster than x

(e) $\forall x \forall y[(\Diamond(x \neq y)) \rightarrow \Box(x \neq y)]$

For all X and Y, if it is possible for x to not equal y, then x must not equal y

2. Counterexamples

