

$$\forall x \exists y (P(x) \wedge Q(y)) \neq \exists y \forall x (P(x) \wedge Q(y))$$

→ show: $\forall x \exists y (P(x) \wedge Q(y)) \wedge \forall y \exists x (\neg P(x) \vee \neg Q(y))$ is satisfiable

$$\forall x \exists y (P(x) \wedge Q(y)) \wedge \dots \dots \dots$$

$$\forall y \exists x (\neg P(x) \vee \neg Q(y))$$

$$\exists y (P(a) \wedge Q(y)) \quad x/a$$

$$P(a) \wedge Q(b) \quad y/b, b \text{ is new}$$

$$P(a)$$

$$Q(b)$$

$$\exists x (\neg P(x) \vee \neg Q(b)) \quad y/b$$

$$\neg P(c) \vee \neg Q(b) \quad x/c \text{ c is new}$$

$$\neg P(c)$$

$$\neg Q(b)$$

$$\exists y (P(c) \wedge Q(y))$$

$$P(c) \wedge Q(d)$$

$$P(c)$$

$$Q(d)$$

|

~~Q~~

x/c

y/d d is new