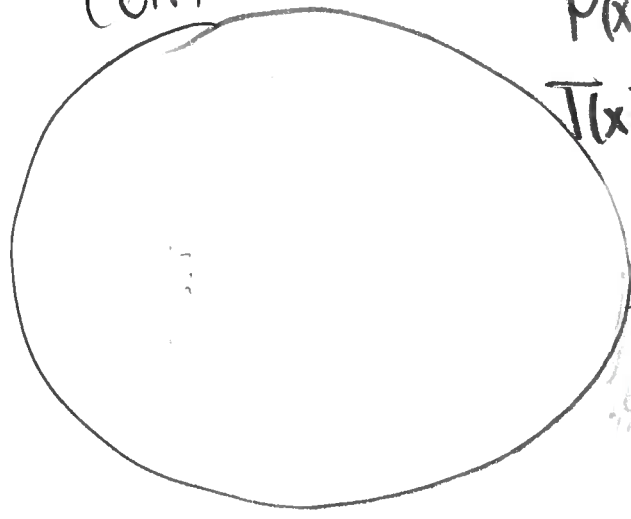


coins



$P(x)$: x is in my pocket

$T(x)$: x is on the table

$Q(x)$: x is a quarter

$D(x)$: x is a dime

\forall

Every

coin in my pocket is a quarter.

Which one?

this is how we symbolize "every x is y "

~~$\forall x (P(x) \wedge Q(x))$~~

~~in pocket and a quarter~~

~~All coins are in my pocket and~~

~~All coins are quarter~~

$\forall x (P(x) \rightarrow Q(x))$

if in pocket, then is a quarter

among coins in my pocket, they are all quarters

2

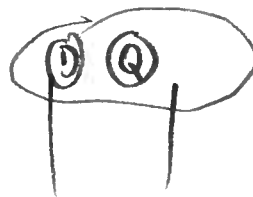
Some coin on the table is a dime,

\exists

Would he use

weird

$\rightarrow \exists x (T(x) \rightarrow D(x)) \leftarrow$



or

$\exists x (T(x) \wedge D(x))$

" \forall " tends to use \rightarrow

" \exists " tends to use \wedge

p. 200 #3 | Way 1: $\neg \forall x (T(x) \rightarrow D(x))$

Way 2: $\exists x (T(x) \wedge \neg D(x))$



#4 | Way 1: $\forall x (P(x) \rightarrow \neg D(x))$

Way 2: $\neg \exists x (P(x) \wedge D(x))$

"Only dimes are on table."



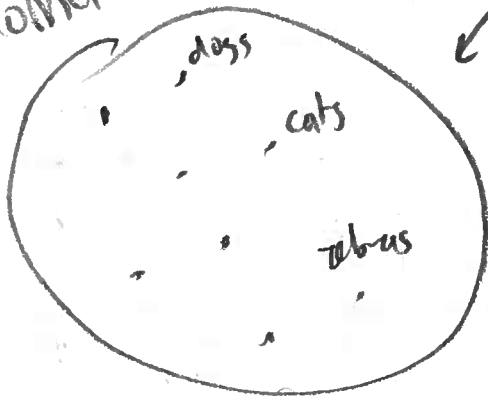
$$\neg \exists x (T(x) \wedge \neg D(x))$$

$$\forall x (T(x) \rightarrow D(x))$$

(suppose)

p. 203 domain: animals

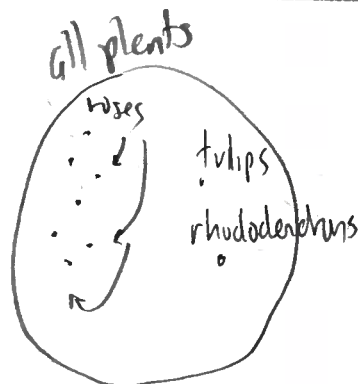
no monkeys



$\forall x (M(x) \rightarrow S(x)) \leftarrow$ true (assuming no monkeys in domain)

$\exists x (M(x) \wedge S(x)) \leftarrow$ false (no monkey... so $M(x)$ false)

p. 205



$$\forall x (R(x) \rightarrow T(x))$$



$$\forall x (T(x))$$

p. 211)

4

#4) All G are F. Some H is G. \therefore Some H is F.

$$\forall x (G(x) \rightarrow F(x)), \exists x (H(x) \wedge G(x))$$

$$\therefore \exists x (H(x) \wedge F(x))$$

#13) All F are G. No G are H. \therefore No H is F.

$$\forall x (F(x) \rightarrow G(x)), \forall x (G(x) \rightarrow \neg H(x))$$

$$\therefore \forall x (H(x) \rightarrow \neg F(x))$$

#11) No G are F. Some G is H. \therefore Some H is not F.

$$\forall x (G(x) \rightarrow \neg F(x)), \exists x (G(x) \wedge H(x))$$

$$\therefore \exists x (H(x) \wedge \neg F(x))$$