Arguments With Quantified Statements

Universal Instantiation:

If a property is true of everything in a set, then it is true of any particular thing in the set.

All men are mortal.
Socrates is a man.
$\therefore$ Socrates is mortal.

Universal Modus Ponens:

$\forall x, P(x) \to Q(x)$
$P(a)$, for particular a
$\therefore Q(a)$

Universal Modus Tollens:

$\forall x, P(x) \to Q(x)$
$\neg Q(a)$, for particular a
$\therefore \neg P(a)$

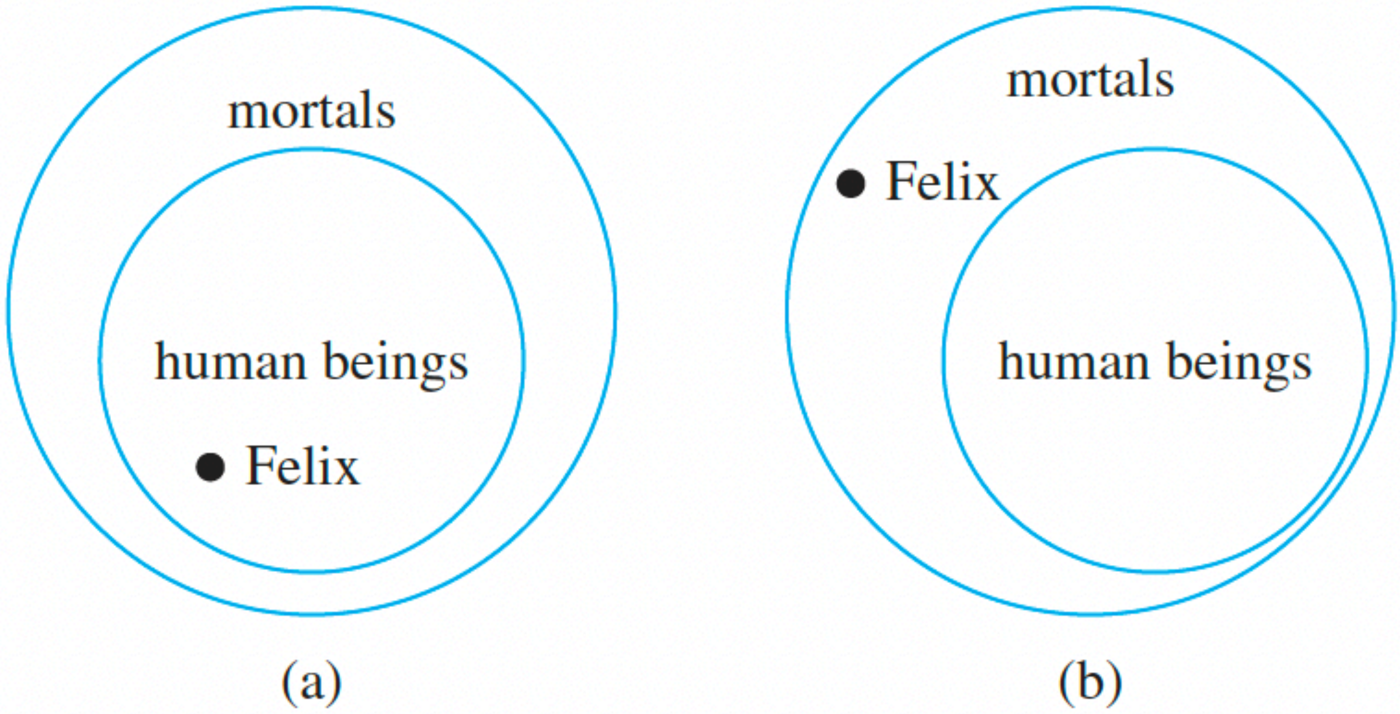
Universal Transitivity:

$\forall x, P(x) \to Q(x)$
$\forall x, Q(x) \to R(x)$
$\therefore \forall x, P(x) \to R(x)$

Euler Diagrams:

All human beings are mortal
Felix is mortal
$\therefore$ Felix is human being

$\forall x \in H, H(x) \to M(x)$
$M(F)$
$\therefore H(F)$
(Wrong Logic)



Converse Error (Affirming the consequent):

$\forall x,\ P(x) \to Q(x)$

$Q(a)$, for particular a

$\therefore P(a)$ (Wrong Logic)

Inverse Error (Denying the antecedent):

$\forall x,\ P(x) \to Q(x)$

$\neg P(a)$, for particular a.

$\therefore \neg Q(a)$ (Wrong Logic)