C2 Tutorial

CL Tutorials

oct 6 2023

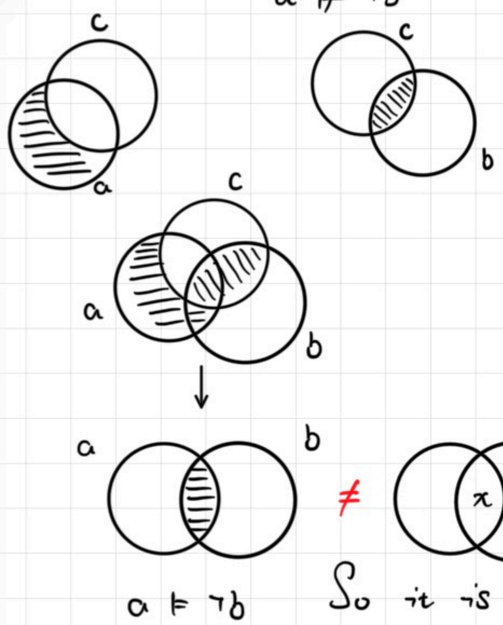
Exercise 1

Case 1 :

a: All diligent students are successful
c: All ignorant students are unsuccessful
b: Some diligent students are ignorant

$a \vDash c \qquad b \vDash \neg c$

$a \nvDash \neg b$



$a \vDash \neg b$

So it is contradict to the conclusion $a \nvDash \neg b$. Therefore it does not sound "Incorrect"

Denying the conclusion

$a \vDash c \qquad a \nvDash b$ (Reverse)

$c \nvDash b$

$\neg b \nvDash \neg c$

Contradict to the opposite of $b \vDash \neg c$

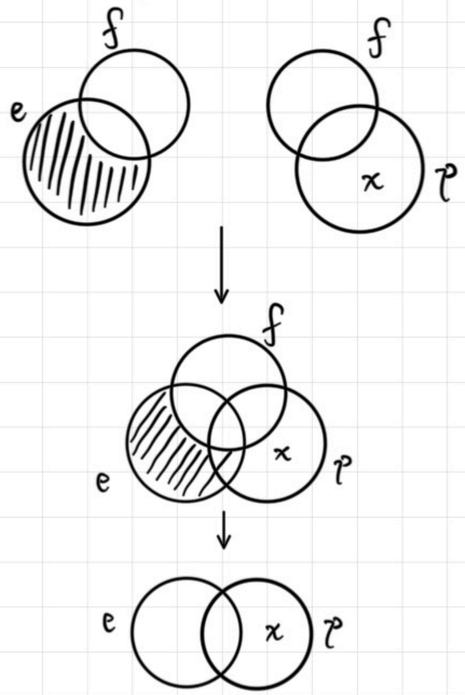
Case 2 :

universe = animals
e = eagles
f = can fly
p = pigs

Inference form :

$$\frac{e \vDash f \qquad p \nvDash f}{p \nvDash e}$$

Venn Diagram



Denying the conclusion

$e \vDash f \qquad p \nvDash \neg e$ (Reverse)

$e \vDash f \qquad \neg\neg e \nvDash \neg p$

$e \vDash f \qquad e \nvDash \neg p$

$f \nvDash \neg p$

$p \nvDash \neg f$

if we reverse the conclusion the argument turns to the opposite of original.

Exercise 2.

a : Animals

Exercise 3.

$a \vDash b \qquad c \vDash a$

(b) From correct syllogism

$a \vDash b \qquad c \nvDash \neg a$

Exercise 2.

a = Animals
b = Unicorns
c = horses

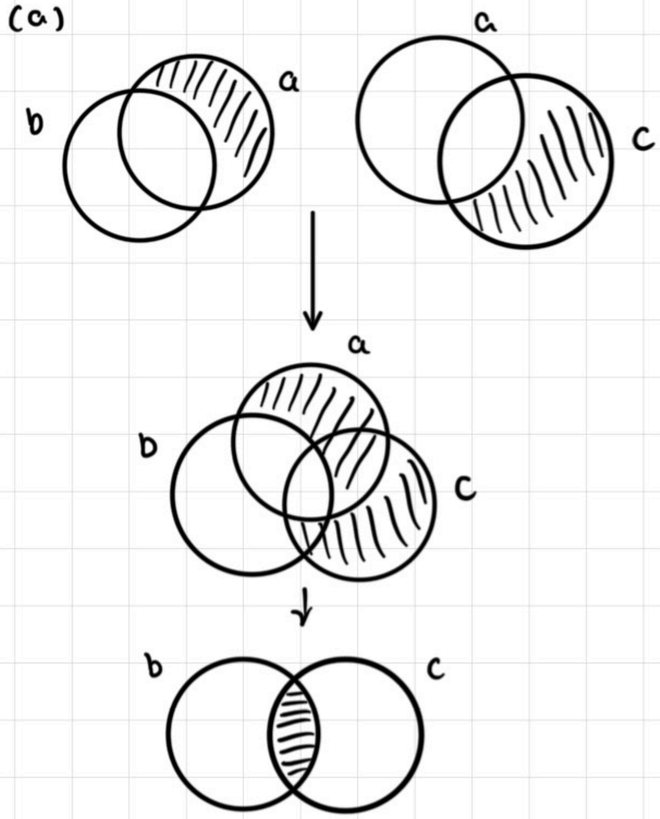
$$\frac{a \models \neg b \qquad b \models c}{c \not\models a}$$

Based on the symbolic representation above, Since the number of $\neg$ and $\not\models$ are not EVEN, which means they don't have a corresponding occurence to deduce the conclusion.

Exercise 3.

$$\frac{a \models b \qquad c \models a}{c \models \neg b}$$

(a)

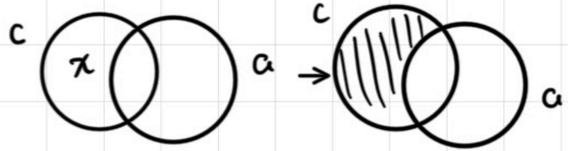


(b) From correct syllogism

$$\frac{a \models b \qquad c \not\models \neg a}{c \not\models \neg b}$$

Assume at least one $c \models a$

So $c \not\models \neg a \longrightarrow c \models a$



Therefore

$$\frac{a \models b \qquad c \models a}{c \models \neg b}$$

e conclusion.
to
ine].

Part B.

Exercise 5

and [hasThickBorder x | x ← Things, isBig x && isAmber x]

or [isDisc x | x ← Things, isSmall x]

or [isAmber x | x ← Things, isSmall x && isSquare x].