Discussion 0a

Tuesday, January 22, 2019 4:15 PM

Topic: Propositional Logic

Notation

- $\mathbb{Z}$: "{integers}"
- $\mathbb{Q}$: "{rational numbers}" = $\{\frac{a}{b} : a, b \in \mathbb{Z}, b \neq 0\}$
- $\mathbb{R}$: "{real numbers}"

Logical Symbols use them to connect statements

- $\neg$: negation
- $\wedge$: AND
- $\vee$: OR
- $\Rightarrow$: implication $(P \Rightarrow Q) \equiv (\neg P \vee Q)$

Quantifiers

- $\exists$: "there exists"

$\forall$: "for all"

De Morgan's Law Distribute and Flip

- $\neg (P \wedge Q) \equiv (\neg P) \vee (\neg Q)$
- $\neg (P \vee Q) \equiv (\neg P) \wedge (\neg Q)$
- $\neg (\forall x\, P(x)) \equiv \exists x (\neg P(x))$
- $\neg (\exists x P(x)) \equiv \forall x (\neg P(x))$