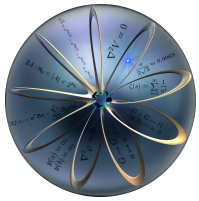

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some valid schemas of first order logic

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In this entry, we record some valid schemas of first order logic $\mathrm{FO}(\Sigma)$ based on the signature Σ:

1. $\forall x A \to \forall y A[y/x]$ if y does not occur free, but free for x, in A
2. $\forall y A[y/x] \to \forall x A$ if y does not occur in A
3. $\forall x A \leftrightarrow A$ if x is not free in A
4. $\exists x A \leftrightarrow A$ if x is not free in A
5. $\forall x \forall y A \to \forall y \forall x A$
6. $\exists x \exists y A \to \exists y \exists x A$
7. $\forall x (A \to B) \to (\forall x A \to \forall x B)$
8. $(\forall x A \to \forall x B) \to \forall x (A \to B)$
9. $\forall x (A \wedge B) \leftrightarrow \forall x A \wedge \forall x B$
10. $\exists x (A \vee B) \leftrightarrow \exists x A \vee \exists x B$
11. $\forall x (A \vee B) \leftrightarrow (\forall x A) \vee B$ if x is not free in B
12. $\exists x (A \wedge B) \leftrightarrow (\exists x A) \wedge B$ if x is not free in B

where A, B are well-formed formulas (wff's) of $\mathrm{FO}(\Sigma)$.