CHAPTER II

THE THEORY OF IDENTITY

(1) Definition of identity

"$x \equiv y$" means "x has every property of y and y has every property of x."

(2) Rule of substitution

If $x \equiv y$, then any expression containing x is identical with the corresponding expression containing y in place of x.

(3) Th. $x \equiv x$

(4) Th. If $x \equiv y$ then $y \equiv x$

(5) Th. If $x \equiv y$ and $y \equiv z$ then $x \equiv z$

(6) Th. If $x \equiv z$ and $y \equiv z$ then $x \equiv y$

<u>Example of proof: th. (3)</u>

" $x \equiv x$ " means " x has every property of x and x has every property of x."

The latter statement is obviously true.

<u>Example of proof: th. (5)</u>

Suppose $x \equiv y$ ------------------- (1)

and $y \equiv z$ ------------------- (2)

Then, from (2), any expression containing y is identical with the corresponding expression containing z in place of y (Rule of substitution).

Therefore, from (1), " $x \equiv y$ " is identical with the "$x \equiv z$."

Therefore if $x \equiv y$ and $y \equiv z$ are true, it follows that $x \equiv z$ is true.