

High school geometry theorems

Hilbert's axiomatic system.
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Theorem 1 (th_10_01.) *Assuming that $A \notin \alpha$ and $A \in p$ and $B \in p$ and $C \in p$ and $B \in \alpha$ and $C \in \alpha$ it holds that $B = C$.*

Proof:

1. From the facts $A \in p$ and $A \notin \alpha$ it holds that $p \notin \alpha$ (using *ax_D11b*).
2. It holds that $B = C$ or $B \neq C$.
3. Assume that: $B = C$.
4. The conclusion follows from the fact $B = C$.
5. Assume that: $B \neq C$.
6. From the facts $B \neq C$ and $B \in p$ and $C \in p$ and $B \in \alpha$ and $C \in \alpha$ it holds that $p \in \alpha$ (using *ax_I6*).
7. From the facts $p \notin \alpha$ and $p \in \alpha$ we get contradiction.
8. The conjecture follows in all cases.

QED
