

# High school geometry theorems

Hilbert's axiomatic system.  
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**Theorem 1 (th\_9\_01.)** *Assuming that  $p \neq q$  and  $A \in p$  and  $B \in p$  and  $A \in q$  and  $B \in q$  it holds that  $A = B$ .*

*Proof:*

1. It holds that  $A = B$  or  $A \neq B$ .
2. Assume that:  $A = B$ .
3. The conclusion follows from the fact  $A = B$ .
4. Assume that:  $A \neq B$ .
5. From the facts  $A \neq B$  and  $A \in p$  and  $B \in p$  and  $A \in q$  and  $B \in q$  it holds that  $p = q$  (using *ax\_I2*).
6. From the facts  $p \neq q$  and  $p = q$  we get contradiction.
7. The conjecture follows in all cases.

QED

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