

Theorem 10

Given lines \overleftrightarrow{AB} and \overleftrightarrow{CD} such that $\overleftrightarrow{AB} \neq \overleftrightarrow{CD}$

Suppose $\overleftrightarrow{AB} \cap \overleftrightarrow{CD}$ includes more than one point

Let $X, Y \in \overleftrightarrow{AB} \cap \overleftrightarrow{CD}$

then by theorem 9, because $X, Y \in \overleftrightarrow{AB}$

$$\overleftrightarrow{XY} = \overleftrightarrow{AB} \quad (1)$$

and by thm 9 again, $X, Y \in \overleftrightarrow{CD}$

$$\overleftrightarrow{XY} = \overleftrightarrow{CD} \quad (2)$$

so by (1), (2) $\overleftrightarrow{AB} = \overleftrightarrow{CD}$, but $\overleftrightarrow{AB} \neq \overleftrightarrow{CD}$

Contradiction

So $\overleftrightarrow{AB} \cap \overleftrightarrow{CD}$ does not include more than one point

is false

Q.E.D.