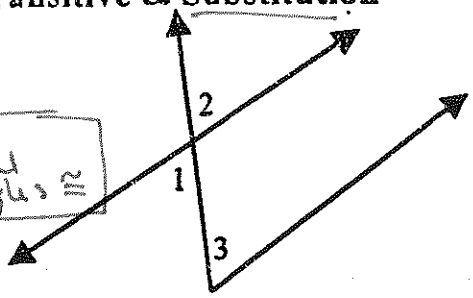
Law of Syllogism

Given: $p \to q$, $q \to r$ ← Transitive

Conclusion: $p \to r$

Sample Flowproofs using Transitive & Substitution

1. Given: $\angle 2 \cong \angle 3$
   Prove: $\angle 1 \cong \angle 3$

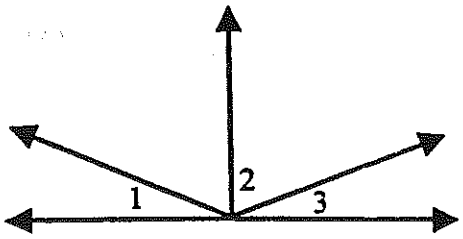


Given: $\angle 2 \cong \angle 3$, $p \to r$

vertical angles $\cong$: $\angle 1 \cong \angle 2$, $p \to q$

$\angle 1 \cong \angle 3$, $p \to r$ — Transitive

2. Given: $m\angle 2 + m\angle 3 = 90$
   $m\angle 1 = m\angle 3$
   Prove: $\angle 1$ and $\angle 2$ are complementary



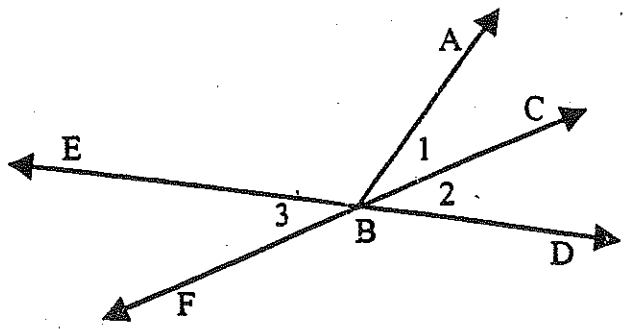
Given: $m\angle 2 + m\angle 3 = 90$

Given: $m\angle 1 = m\angle 3$

$m\angle 2 + m\angle 1 = 90$ — Substitution

$\angle 2, \angle 1$ are complementary — Def. of comp. $\angle$s

3. Given: $\overline{BC}$ bisects $\angle ABD$
Prove: $\angle 1 \cong \angle 3$



Given: $\overrightarrow{BC}$ bisects $\angle ABD$

$\angle 1 \cong \angle 2$ (Def. of $\angle$ bisector)

$p \rightarrow q$

$q \rightarrow r$

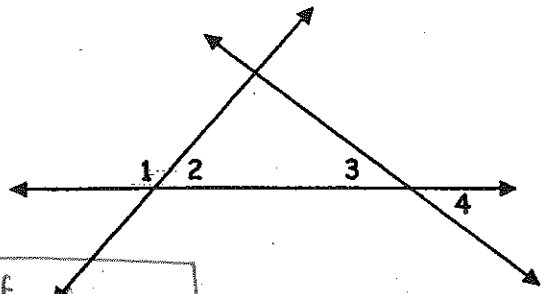
$\angle 2 \cong \angle 3$

Vert. $\angle$s $\cong$

$\angle 1 \cong \angle 3$

Transitive

4. Given: $\angle 2 \cong \angle 3$
Prove: $m\angle 1 + m\angle 4 = 180$



Given: $\angle 2 \cong \angle 3$

$p \rightarrow q$

$\angle 1 + \angle 2 = 180$ (Def. of Linear pair OR Supp. $\angle$s)

$\angle 3 \cong \angle 4$ (Vertical $\angle$s)

$q \rightarrow r$

$\angle 2 \cong \angle 4$ (Transitive)

$\angle 1 + \angle 4 = 180$ (Substitution)