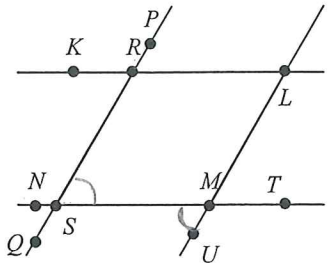
Name: Key

Parallel and Proofs

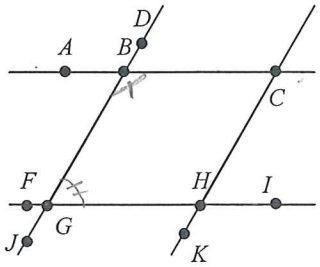
Write a proof of the theorem.

1. If $\angle RSM \cong \angle SMU$, then $\overleftrightarrow{PS} \parallel \overleftrightarrow{LM}$.



1. $\angle RSM \cong \angle SMU$ — 1. given
2. $\overleftrightarrow{RS} \parallel \overleftrightarrow{LM}$ — 2. $\cong$ alt int $\angle$s form Parallel lines

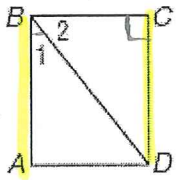
2. If $m\angle GBC + m\angle HGB = 180$, then $\overleftrightarrow{FH} \parallel \overleftrightarrow{AC}$.



1. $\angle GBC + \angle HGB = 180$ — 1. given
2. $\overleftrightarrow{FH} \parallel \overleftrightarrow{AC}$ — 2. Suppl. con. int $\angle$s form $\parallel$ lines

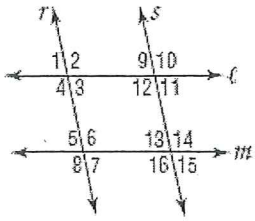
3.

Given: $\angle 1$ and $\angle 2$ are complementary.
$\overline{BC} \perp \overline{CD}$
Prove: $\overline{BA} \parallel \overline{CD}$
Proof:



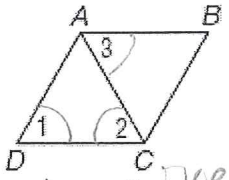
1. $\angle 1$ and $\angle 2$ are compl. $BC \perp CD$ — 1. given
2. $\angle 1 + \angle 2 = 90$ — 2. def of compl.
3. $\angle BCD = 90$ — 3. def of $\perp$
4. $\angle 1 + \angle 2 = \angle CBA$ — 4 angle addition
5. $\angle ABC = 90$ — 5. substitution
6. $BA \parallel CD$ — 6. 2 lines $\perp$ to the same line are $\parallel$.

4. **For Exercises 1–6, complete the proof.**
Given: $\angle 1 \cong \angle 5$, $\angle 15 \cong \angle 5$
Prove: $\ell \parallel m$, $r \parallel s$



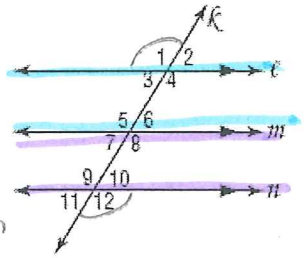
Statements	Reasons
1. $\angle 15 \cong \angle 5$	1. given
2. $\angle 13 \cong \angle 15$	2. vertical ∠s are ≅
3. $\angle 5 \cong \angle 13$	3. transitive
4. $r \parallel s$	4. ≅ corresp. ∠s form ∥ lines
5. ∠1 ≅ ∠5	5. Given
6. ℓ∥m	6. If corr ∠s are ≅, then lines ∥.

5. **Given:** $\angle 1 \cong \angle 2$, $\angle 1 \cong \angle 3$
Prove: $\overline{AB} \parallel \overline{DC}$



1. ∠1 ≅ ∠2, ∠1 ≅ ∠3 — 1. given
2. ∠2 ≅ ∠3 — 2. transitive
3. $\overline{AB} \parallel \overline{DC}$ — 3. ≅ alt int ∠s form Parallel lines

6. Given: $\ell \parallel m$, $m \parallel n$
Prove: $\angle 1 \cong \angle 12$



1. ℓ∥m, m∥n — 1. given
2. ℓ∥n — 2. transitive
3. ∠1 ≅ ∠12 — 3. ∥ lines form ≅ alt ext. ∠s