Geo Section 3.5 Name Key

Proving Lines Parallel Notes Date________

Corresponding Angles Converse Postulate:

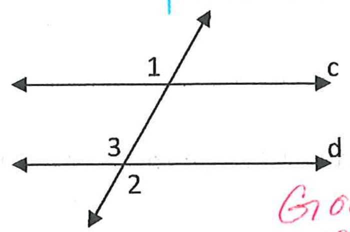
- If corresponding angles are congruent then the lines are parallel.

Proof of the Alternate Exterior Angles Converse Theorem:

- If alternate exterior angles are congruent then the lines are parallel..

Given: $\angle 1 \cong \angle 2$

Prove: c $\parallel$ d



1. $\angle 1 \cong \angle 2$ — 1. Given
2. $\angle 3 \cong \angle 2$ — 2. Vertical $\angle$s are $\cong$
3. $\angle 3 \cong \angle 1$ — 3. Substitution
4. c // d — 4. $\cong$ corr. $\angle$s form // lines

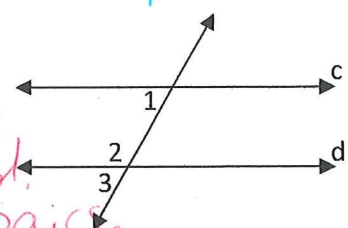
Goal is to get $\cong$ corr. $\angle$s so then you can say //.

Proof of the Consecutive Interior Angles Converse Theorem:

- If consecutive interior angles are ~~cong~~ supplementary then the lines are parallel.

Given: $\angle 1$ & $\angle 2$ *are supplementary*

Prove: c $\parallel$ d



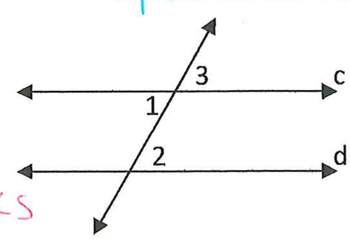
1. $\angle 1$ and $\angle 2$ suppl. — 1. given
2. $\angle 1 + \angle 2 = 180$ — 2. def of suppl.
3. $\angle 2 + \angle 3 = 180$ — 3. linear pairs are suppl.
4. $\angle 1 \cong \angle 3$ — 4. $\angle$s suppl. to the same $\angle$ are $\cong$
5. c // d — 5. $\cong$ corr. $\angle$s form // lines

Proof of the Alternate Interior Angles Converse Theorem:

- If alternate interior angles are congruent then the lines are parallel.

Given: $\angle 1 \cong \angle 2$

Prove: c $\parallel$ d

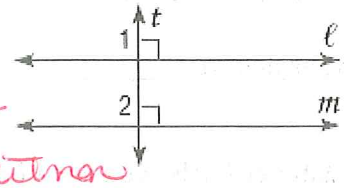


1. $\angle 1 \cong \angle 2$ — 1. given
2. $\angle 1 \cong \angle 3$ — 2. vertical $\angle$s are $\cong$
3. $\angle 2 \cong \angle 3$ — 3. substitution
4. c // d — 4. $\cong$ corr. $\angle$s form // lines

Proof of:

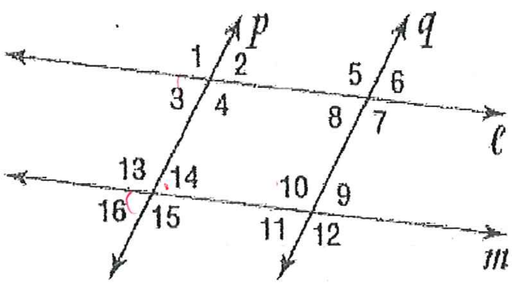
- If two lines are perpendicular to the same line, then they are perpendicular.

Given: $l \perp t$ and $m \perp t$
Prove: $l \parallel m$



1. $\ell \perp t$ and $m \perp t$	1. given
2. $\angle 1 = 90$, $\angle 2 = 90$	2. def of $\perp$
3. $\angle 1 \cong \angle 2$	3. Substitution
4. $\ell \parallel m$	4. $\cong$ corr. $\angle$s form $\parallel$ lines

Example1: Determine which lines, if any, are parallel. State which postulate or theorem that justifies your answer.



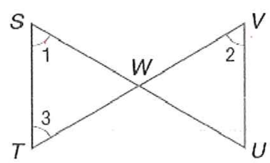
$\angle 16 \cong \angle 3$

$\ell \parallel m$ by $\cong$ corr. $\angle$s form $\parallel$ lines

$m\angle 14 + m\angle 10 = 180$

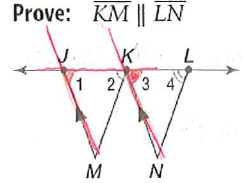
$p \parallel q$ by suppl. con. interior $\angle$s form $\parallel$ lines.

23. Given: $\angle 2 \cong \angle 1$
$\angle 1 \cong \angle 3$
Prove: $\overline{ST} \parallel \overline{UV}$



1. $\angle 2 \cong \angle 1$, $\angle 1 \cong \angle 3$	1. given
2. $\angle 3 \cong \angle 2$	2. Substitution
3. $ST \parallel UV$	3. $\cong$ alt. int $\angle$s form $\parallel$ lines

24. Given: $\overline{JM} \parallel \overline{KN}$
$\angle 1 \cong \angle 2$
$\angle 3 \cong \angle 4$
Prove: $\overline{KM} \parallel \overline{LN}$



1. $JM \parallel KN$, $\angle 1 \cong \angle 2$, $\angle 3 \cong \angle 4$	1. given
2. $\angle 1 \cong \angle 3$	2. corr. $\angle$s $\cong$
3. $\angle 2 \cong \angle 4$	3. Substitution
4. $KM \parallel LN$	4. $\cong$ corresp. $\angle$s form $\parallel$ lines