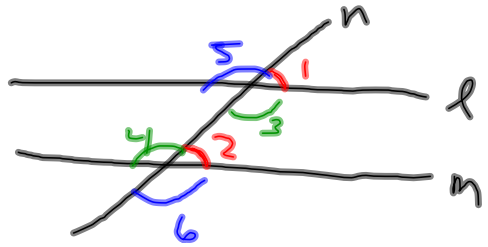
3.3 Proving lines are parallel

Converse of corr. ∠'s postulate:

if 2 coplanar lines are cut by a transversal so that the corr. ∠'s formed are ≅, then the lines are ||.



since ∠1 ≅ ∠2, then ℓ || m

Converse of the AIA thm.

if 2 coplanar lines are cut by a transversal so that the AIA formed are ≅, then the lines are parallel.

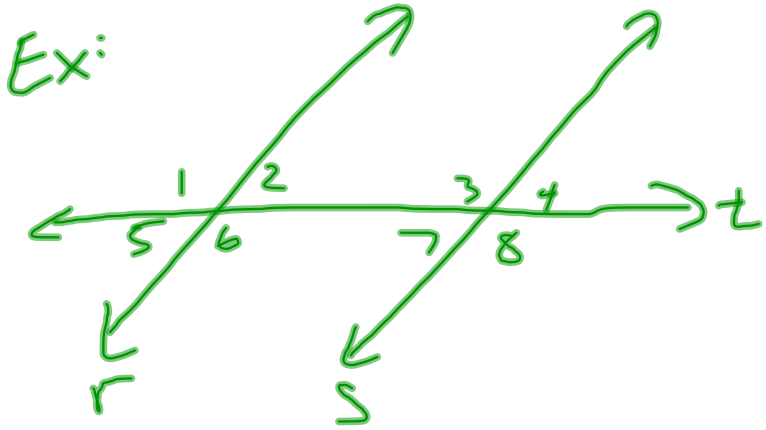
Converse of the AEA thm:

if 2 coplanar lines are cut by a transversal so that the AEA formed are ≅, then the lines are ||.

Converse of SSIA thm

if 2 coplanar lines are cut by a transversal so that the SSIA formed are supp., then the lines are ||.

Ex:



prove r||s given $m\angle 6 = 6x+18$ and, $m\angle 7 = 9x+12$ and $x=10$

$m\angle 6 = 6x+18 = 6\cdot 10+18 = 78^\circ$

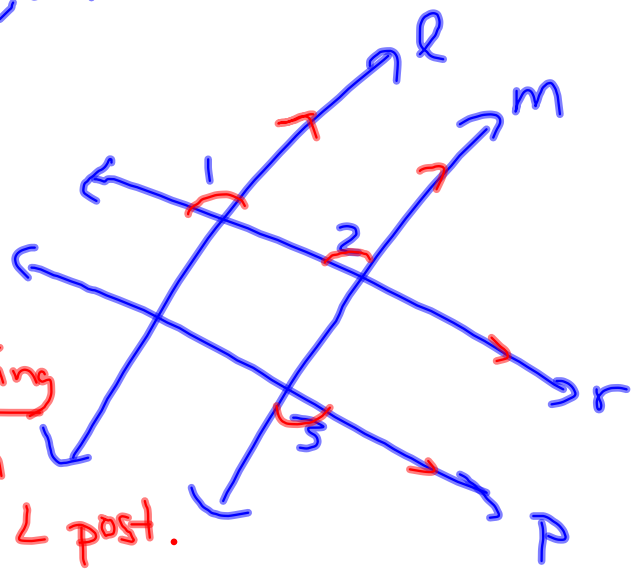
$m\angle 7 = 9x+12 = 9\cdot 10+12 = 102^\circ$

$m\angle 6 + m\angle 7 = 78^\circ + 102^\circ = 180^\circ$

So r||s by converse of SSIA thm

Given: $\ell \parallel m$, $\angle 1 \cong \angle 3$.

Prove: $r \parallel p$



Statement	reasoning
1. $\ell \parallel m$	1. Given
2. $\angle 1 \cong \angle 2$	2. corr. $\angle$ post.
3. $\angle 1 \cong \angle 3$	3. Given
4. $\angle 2 \cong \angle 3$	4. subs. / tran. prop of $\cong$.
5. $r \parallel p$	5. conv. of ~~AE~~ Athm.

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2-40 even, odds extra credit