

Topic 2-2 "Proving Parallel Lines"

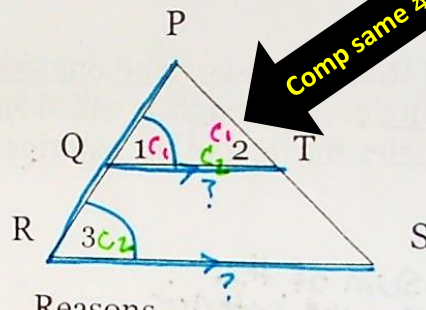
Example:

3.) (#20 pg. 222)

Given: $\angle 1$ comp. $\angle 2$

$\angle 3$ comp. $\angle 2$

Prove: $\overline{QT} \parallel \overline{RS}$



Statements	Reasons
1 $\angle 1$ comp $\angle 2$	1 Given
2 $\angle 3$ comp $\angle 2$	2 Given
3 $\angle 1 \cong \angle 3$	3 Comps of same \angle are \cong
4 $\overline{QT} \parallel \overline{RS}$	4 Corr \angle 's $\cong \Rightarrow \parallel$ lines

Theorems for Proving Lines Parallel:

1. If 2 lines are cut by a transversal such that 2 alt. int. \angle s are \cong then the lines are \parallel .

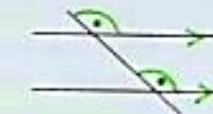
Short Way: Alt Int \angle 's $\cong \Rightarrow \parallel$ lines

Example:



2. If 2 lines are cut by a transversal such that 2 corr. \angle s are \cong then the lines are \parallel .

Short Way: Corr \angle 's $\cong \Rightarrow \parallel$ lines



3. If 2 lines are cut by a transversal such that 2 alt. ext. \angle s are \cong then the lines are \parallel .

Short Way: Alt. Ext. \angle 's $\cong \Rightarrow \parallel$ lines



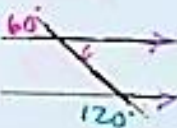
4. If 2 lines are cut by a transversal such that 2 int. \angle s on the same side of the transversal are supp. then the lines are \parallel .

Short Way: Same-side Int \angle 's supp $\Rightarrow \parallel$ lines



5. If 2 lines are cut by a transversal such that 2 ext. \angle s on the same side of the transversal are supp. then the lines are \parallel .

Short Way: Same-side Ext \angle 's supp $\Rightarrow \parallel$ lines



6. If 2 coplanar lines are \perp to a third line, then they are \parallel .

No Short Way! Well, maybe a little

ex:

Given: $a \perp m$

$b \perp m$

Conclusion: $a \parallel b$



2 coplanar lines \perp to 3rd line $\Rightarrow \parallel$ lines