

Geometry CC - Unit 6  
Lesson 1: Proving Lines Parallel  
M1.L22-27

DO NOW: Name 3 different angle relationships that can prove lines are parallel.

Corresponding  $\angle$ 's alt. interior  $\angle$ 's alt. exterior  $\angle$ 's

Hello I may see you later

THEOREMS we can use to prove that LINES ARE PARALLEL:

1) If two lines cut by a transversal form corresponding angles, then the lines are parallel.

2) If two lines cut by a transversal form alternate interior angles, then the lines are parallel.

3) If two lines cut by a transversal form alternate exterior angles, then the lines are parallel.

1) if  $\rightarrow$    
 2) if  $\rightarrow$    
 3)  $\rightarrow$

Dec 2-8:21 AM

1. Given:  $\triangle CAB$  is isosceles with vertex  $A$ ,  $\angle 2 \cong \angle 3$

Prove:  $m \parallel n$

Statement	Reason
1) $\triangle CAB$ is isosceles with vertex $A$	1) Given
2) $\angle 2 \cong \angle 3$	2) Given
3) $\angle 1 \cong \angle 2$	3) An isoc. $\triangle$ has 2 $\cong$ base $\angle$ 's
4) $\angle 1 \cong \angle 3$	4) Substitution Property
5) $m \parallel n$	5) if $\rightarrow$

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2. Given:  $\overline{QU} \cong \overline{DA}$ ,  $\overline{UA} \cong \overline{QD}$

Prove:  $\overline{QU} \parallel \overline{DA}$

Statement	Reason
1) $\overline{QU} \cong \overline{DA}$	1) Given
2) $\overline{UA} \cong \overline{QD}$	2) Given
3) $\overline{QA} \cong \overline{QA}$	3) Reflexive Prop.
4) $\triangle DAQ \cong \triangle UQA$	4) SSS $\cong$ SSS
5) $\angle UQA \cong \angle DAQ$	5) CPCTC
6) $\overline{QU} \parallel \overline{DA}$	6) If two lines cut by a transversal form alt. exterior $\angle$ 's then the lines are $\parallel$

if  $\rightarrow$

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3. Given:  $\overline{QT}$  bisects  $\angle PQS$ ,  $\angle 1 \cong \angle 3$

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

Statement	Reason
1) $\overline{QT}$ bisects $\angle PQS$	1) Given
2) $\angle 1 \cong \angle 3$	2) Given
3) $\angle 1 \cong \angle 2$	3) Def. of an $\angle$ bisector
4) $\angle 2 \cong \angle 3$	4) Substitution Property
5) $\overline{QT} \parallel \overline{RS}$	5) If two lines cut by a transversal form alt. exterior $\angle$ 's then the lines are $\parallel$

if  $\rightarrow$

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4. Given:  $\overline{AB} \cong \overline{DE}$ ,  $\overline{CB} \cong \overline{FE}$ ,  $\angle B \cong \angle E$

Prove:  $\overline{AB} \parallel \overline{DE}$

Statement	Reason
1) $\overline{AB} \cong \overline{DE}$	1) Given
2) $\overline{CB} \cong \overline{FE}$	2) Given
3) $\angle B \cong \angle E$	3) Given
4) $\triangle ABC \cong \triangle DEF$	4) SAS $\cong$ SAS
5) $\angle BAC \cong \angle EDF$	5) CPCTC
6) $\overline{AB} \parallel \overline{DE}$	6) if $\rightarrow$

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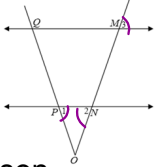
5. Given:  $l \perp m$ ,  $m \perp k$

Prove:  $l \parallel k$

Statement	Reason
1) $l \perp m$	1) Given
2) $m \perp k$	2) Given
3) $\angle 1$ & $\angle 2$ are rt. $\angle$ 's	3) $\perp$ lines form rt. $\angle$ 's
4) $\angle 1 \cong \angle 2$	4) All rt. $\angle$ 's are $\cong$
5) $l \parallel k$	5) if $\rightarrow$

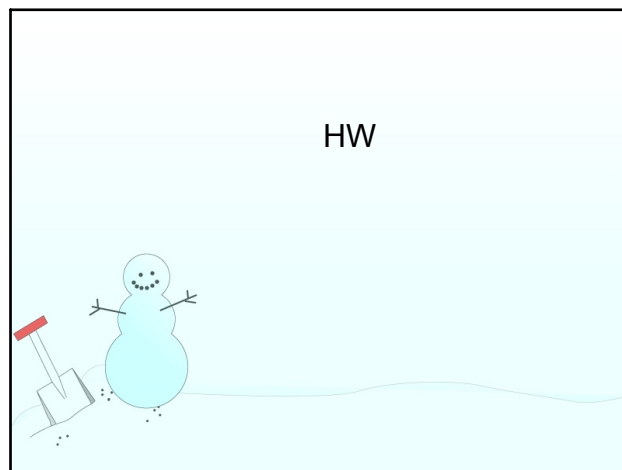
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6. Given:  $\triangle PON$  is isosceles with vertex  $O$ ,  
 $\angle 1 \cong \angle 3$   
 Prove:  $\overline{QM} \parallel \overline{PN}$



Statement	Reason
1) $\triangle PON$ is isosceles with vertex $O$	1) Given
2) $\angle 1 \cong \angle 3$	2) Given
3) $\angle 1 \cong \angle 2$	3) An isoc. $\Delta$ has 2 $\cong$ base $\angle$ s
4) $\angle 2 \cong \angle 3$	4) Substitution Property
5) $\overline{QM} \parallel \overline{PN}$	5) if <del>...</del> $\rightarrow$ <del>...</del>

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