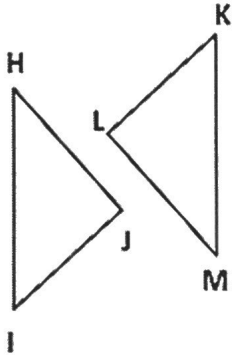


Proving Triangles Congruent

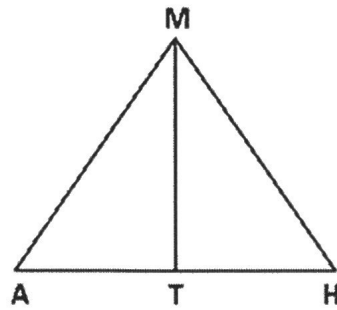
For each diagram, mark it with the given information, add any additional markings that are allowed, decided if they are congruent, and then give the congruence statement.

Given: $\overline{HJ} \cong \overline{LM}$
 $\angle J \cong \angle L$
 $m\angle I = m\angle K$



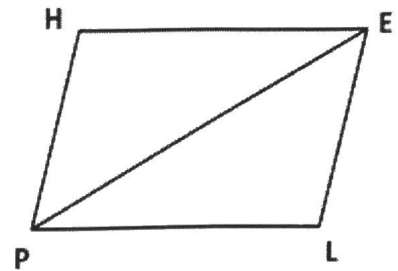
Congruence Rule: _____
 Statement: $\triangle HIJ \cong$ _____

Given: $\overline{MT} \perp \overline{AH}$
 $\overline{MA} \cong \overline{MH}$



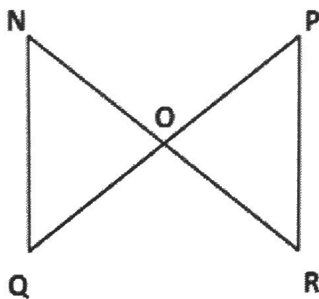
Congruence Rule: _____
 Statement: $\triangle MAT \cong$ _____

Given: $\angle HEP \cong \angle LPE$
 $\overline{HE} \cong \overline{PL}$



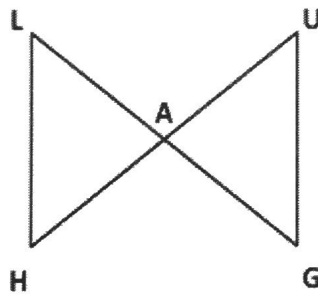
Congruence Rule: _____
 Statement: $\triangle HEP \cong$ _____

Given: $\overline{NO} \cong \overline{OR}$
 $\overline{QO} \cong \overline{OP}$



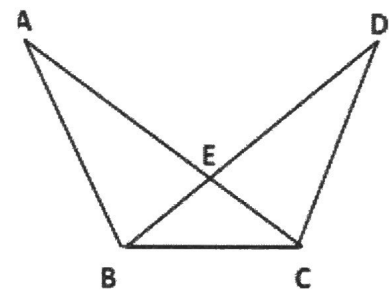
Congruence Rule: _____
 Statement: $\triangle NOQ \cong$ _____

Given: $LA = AG$
 $\angle L \cong \angle G$



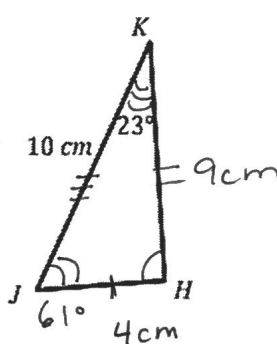
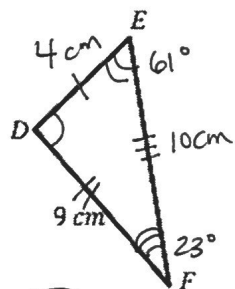
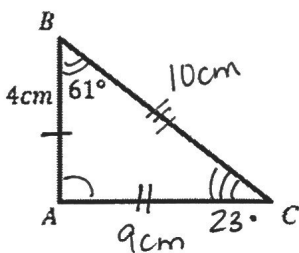
Congruence Rule: _____
 Statement: $\triangle LAH \cong$ _____

Given: $\angle A \cong \angle D$
 $\angle ABE \cong \angle DCE$



Congruence Rule: _____
 Statement: $\triangle ABE \cong$ _____

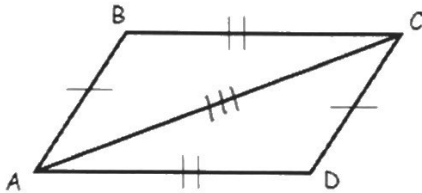
Given: $\triangle ABC \cong \triangle DEF \cong \triangle HJK$, find the all missing angles and sides.



$m\angle A = m\angle D = m\angle H = 96^\circ$

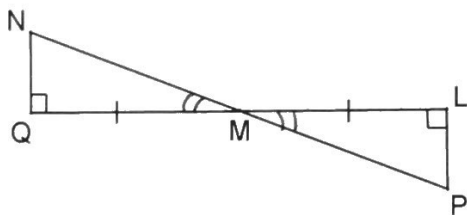
From yesterday, you learned that you only need 3 pieces of information (combination of angles and sides) to determine if two triangles are congruent. Today, we are going to prove two triangles are congruent using two column proofs.

A. Given: $\overline{AB} \cong \overline{CD}$, $\overline{BC} \cong \overline{AD}$
 Prove: $\triangle ABC \cong \triangle CDA$



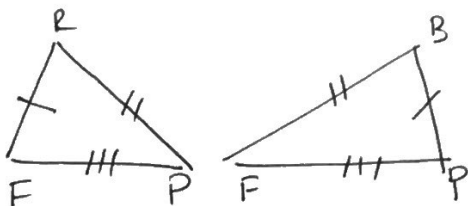
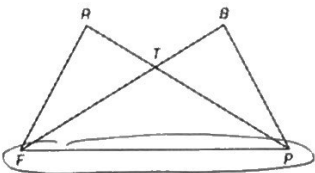
Statements	Reasons
1. $\overline{AB} \cong \overline{CD}$	1. given
2. $\overline{BC} \cong \overline{AD}$	2. given
3. $\overline{AC} \cong \overline{AC}$	3. Reflexive Prop.
4. $\triangle ABC \cong \triangle CDA$	4. SSS

B. Given: $\overline{QM} \cong \overline{ML}$ and $\angle QMN \cong \angle LMP$
 Prove: $\triangle NQM \cong \triangle PLM$



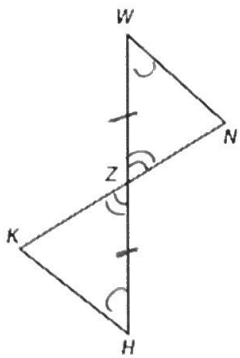
Statements	Reasons
1. $\overline{QM} \cong \overline{ML}$	1. given
2. $\angle QMN \cong \angle LMP$	2. given
3. $\angle Q \cong \angle L$	3. Right. \angle 's are \cong
4. $\triangle NQM \cong \triangle PLM$	4. ASA

C. Given: $\overline{RF} \cong \overline{BP}$ and $\overline{BF} \cong \overline{RP}$
 Prove: $\triangle RFP \cong \triangle BPF$



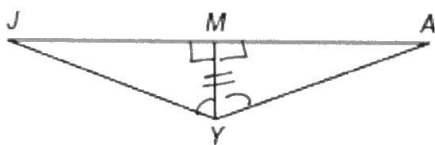
Statements	Reasons
1. $\overline{RF} \cong \overline{BP}$	1. given
2. $\overline{BF} \cong \overline{RP}$	2. given
3. $\overline{FP} \cong \overline{FP}$	3. Reflexive Prop.
4. $\triangle RFP \cong \triangle BPF$	4. SSS

D. Given: $\overline{WN} \parallel \overline{HK}$ Add \overline{WH} has a midpoint of Z .
 Prove: $\triangle WNZ \cong \triangle HKZ$?



S	R
1. $\overline{WN} \parallel \overline{HK}$	1. given
2. $\angle KHZ \cong \angle Nwz$	2. Alt. Int. \angle 's postulate
3. $\angle WzN \cong \angle HzK$	3. Vertical \angle 's are \cong
4. \overline{WH} has a midpoint of Z	4. Given
5. $\overline{Wz} \cong \overline{Zz}$	5. Def. of midpoint
6. $\triangle WNZ \cong \triangle HKZ$	6. ASA

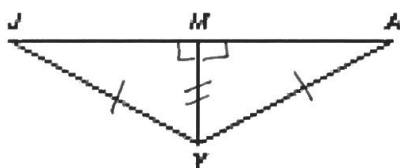
E. Given: $\overline{JA} \perp \overline{MY}$ and \overline{YM} bisects $\angle JYA$
 Prove: $\triangle JYM \cong \triangle AYM$?



Rt. \angle 's $\angle JMY, \angle AMY$
 Bisect $\angle JYM \cong \angle AYM$

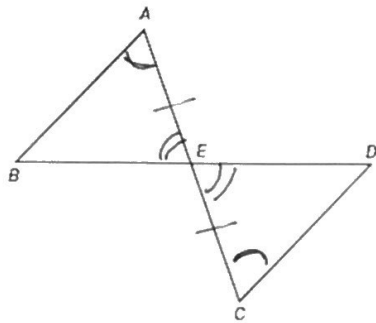
S	R
1. $\overline{JA} \perp \overline{MY}$	1. given
2. $\angle JMY, \angle AMY$ are rt. \angle 's	2. Def. of Perp.
3. $\angle JMY \cong \angle AMY$	3. Def. of Right \angle 's
4. \overline{YM} bisects $\angle JYA$	4. given
5. $\angle JYM \cong \angle AYM$	5. Def. of Bisect
6. $\overline{MY} \cong \overline{MY}$	6. Reflexive Prop.
7. $\triangle JYM \cong \triangle AYM$	7. ASA

F. Given: $\overline{JA} \perp \overline{MY}$ and $\overline{JY} \cong \overline{AY}$
 Prove: $\triangle JYM \cong \triangle AYM$?



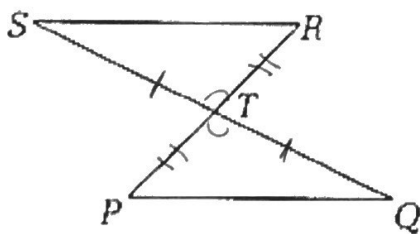
S	R
1. $\overline{JA} \perp \overline{MY}$	1. given
2. $\angle JMY, \angle AMY$ are rt. \angle 's	2. Def. of perp.
3. $\angle JMY \cong \angle AMY$	3. Def. of Right \angle 's
4. $\overline{JY} \cong \overline{AY}$	4. given
5. $\overline{MY} \cong \overline{MY}$	5. Reflexive Prop.
6. $\triangle JYM \cong \triangle AYM$	6. HL

G. Given: $\overline{AB} \parallel \overline{CD}$ and $\overline{AE} \cong \overline{CE}$
 Prove: $\triangle ABE \cong \triangle CDE$?



S	R
1. $\overline{AB} \parallel \overline{CD}$	1. given
2. $\angle BAE \cong \angle DCE$	2. Alt. Int. \angle 's Post.
3. $\angle AEB \cong \angle CED$	3. Vertical \angle 's are \cong
4. $\overline{AE} \cong \overline{CE}$	4. Given
5. $\triangle ABE \cong \triangle CDE$	5. ASA

H. Given: \overline{SQ} and \overline{PR} bisect each other
 Prove: $\triangle RST \cong \triangle PQT$



S	R
1. $\overline{SQ}, \overline{PR}$ Bisect each other	1. given
2. $\overline{ST} \cong \overline{TQ}$ $\overline{RT} \cong \overline{TP}$	2. Def. of Bisect
3. $\angle STR \cong \angle PTQ$	3. Vertical \angle 's are \cong
4. $\triangle RST \cong \triangle PQT$	4. SAS