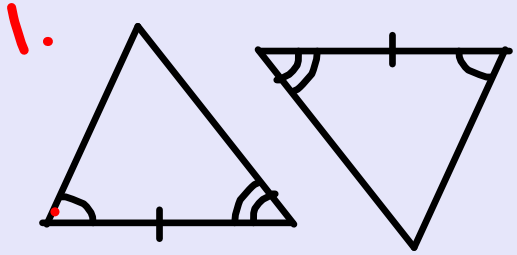
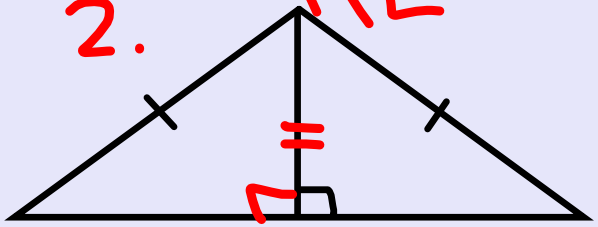
11/6/19 - Warm Up Problem

Why is each pair of triangles congruent?

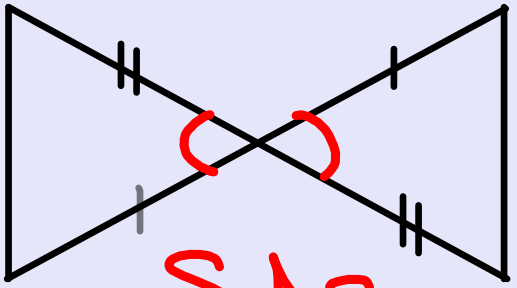
SSS, SAS, AAS, ASA, or HL

1. 

ASA

2. 

HL

3. 

SAS

Concept 10 - Congruent Triangle Proofs

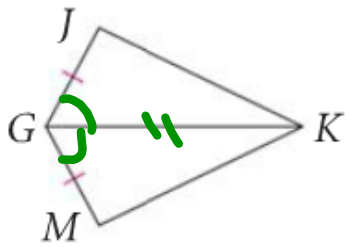
Goal: Prove that two triangles are congruent and complete proofs using CPCTC

WRITING PROOFS FOR CONGRUENT TRIANGLES

1. **GIVEN** – Write all given statements in your proof.
2. **DEFINITIONS** – If your given statements are sentences, change them to equations using definitions.
3. **THEOREMS/POSTULATES** – Look on your diagram for other angles that must be congruent especially **vertical angles** and angles on parallel lines like **corresponding** and **alternate interior**.
4. **REFLEXIVE PROPERTY** – Look for any sides or angles that both triangles share.
5. **CONGRUENCE STATEMENT** – End your proof with the triangle congruence statement justified with one of the triangle congruence shortcuts – **SSS, SAS, ASA, AAS, or HL**

Given: $\overline{GK}$ bisects $\angle JGM$, $\overline{GJ} \cong \overline{GM}$.

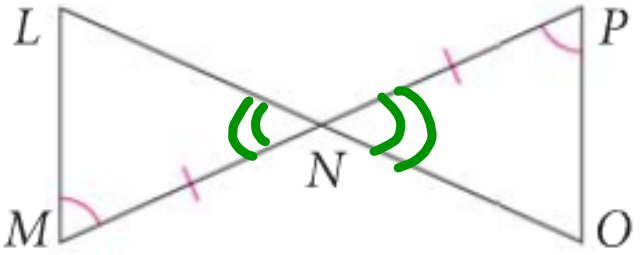
Prove: $\triangle GJK \cong \triangle GMK$



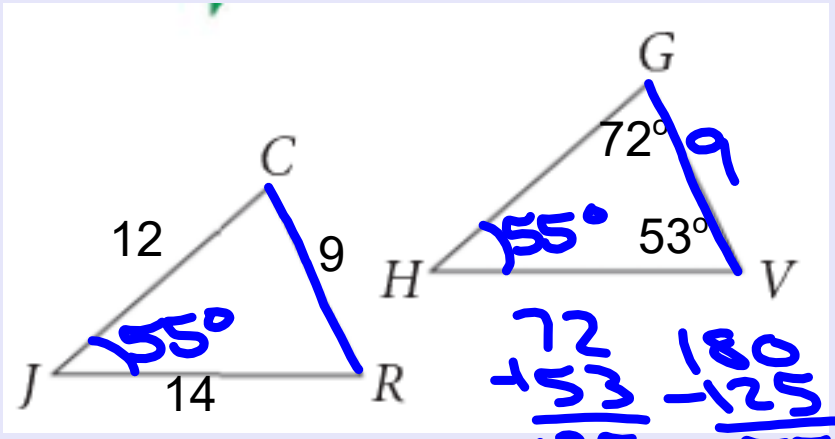
Statements	Justifications
1. $\overline{GK}$ bisects $\angle JGM$	Given
2. $\overline{GJ} \cong \overline{GM}$	Given
3. $\angle JGK \cong \angle MGK$	Def. of Bisect
4. $\overline{GK} \cong \overline{GK}$	Reflexive Prop.
5. $\Delta GJK \cong \Delta GMK$	SAS

Given: $\overline{NM} \cong \overline{NP}, \angle M \cong \angle P$

Prove: $\triangle NML \cong \triangle NPO$



Statements	Justifications
1. $\overline{NM} \cong \overline{NP}$	Given
2. $\angle M \cong \angle P$	Given
3. $\angle LNM \cong \angle ONP$	Vertical Angles Thm
4. $\triangle NML \cong \triangle NPO$	ASA



If $\Delta JCR \cong \Delta HGV$, then...

Angle J =

GV =

72 − 53 = 125

180 − 125 = 55

You are able to transfer measures from one triangle to the other because of this fact:

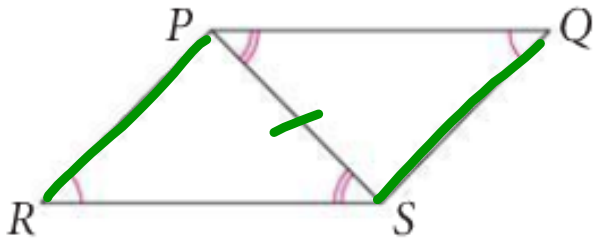
CPCTC

Corresponding Parts of Congruent Triangles are Congruent

Complete this proof in your notes.

Given: $\angle Q \cong \angle R$,
$\angle QPS \cong \angle RSP$

Prove: $\overline{SQ} \cong \overline{PR}$



Statements	Justifications
1. $\angle Q \cong \angle R$	Given
2. $\angle QPS \cong \angle RSP$	Given
3. $\overline{PS} \cong \overline{PS}$	Reflexive Prop.
4. $\Delta PRS \cong \Delta SQP$	AAS
5. $\overline{SQ} \cong \overline{PR}$	CPCTC

Assignment:

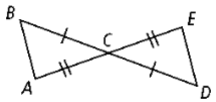
finish Concept 10 Worksheet - due Tuesday 11/12

PROOFS USING SSS, SAS, ASA, AAS, AND HL

Complete each proof by filling in the justifications.

23. Given: $\overline{BC} \cong \overline{DC}, \overline{AC} \cong \overline{EC}$

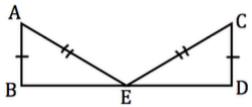
Prove: $\Delta ABC \cong \Delta EDC$



Statements	Justifications
1. $\overline{BC} \cong \overline{DC}$	
2. $\overline{AC} \cong \overline{EC}$	
3. $\angle BCA \cong \angle DCE$	
4. $\Delta ABC \cong \Delta EDC$	

24. Given: $\overline{AE} \cong \overline{CE}$, $\overline{AB} \cong \overline{CD}$, E is the midpoint of $\overline{BD}$

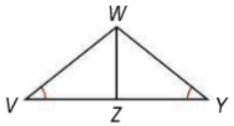
Prove: $\Delta EAB \cong \Delta ECD$



Statements	Justifications
1. $\overline{AE} \cong \overline{CE}$	
2. $\overline{AB} \cong \overline{CD}$	
3. E is the midpoint of $\overline{BD}$	
4. $\overline{BE} \cong \overline{ED}$	
5. $\Delta EAB \cong \Delta ECD$	

25. Given: $\angle V \cong \angle Y$ and $\overline{WZ}$ bisects $\angle VWY$

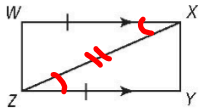
Prove: $\Delta VWZ \cong \Delta YWZ$



Statements	Justifications
1. $\angle V \cong \angle Y$	
2. $\overline{WZ}$ bisects $\angle VWY$	
3. $\angle VWZ \cong \angle YWZ$	
4. $\overline{WZ} \cong \overline{WZ}$	
5. $\Delta VWZ \cong \Delta YWZ$	

26. Given: $\overline{WX} \parallel \overline{YZ}, \overline{WX} \cong \overline{YZ}$

Prove: $\Delta WXZ \cong \Delta YZX$



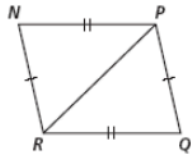
Statements	Justifications
1. $\overline{WX} \parallel \overline{YZ}$	GIVEN
2. $\overline{WX} \cong \overline{YZ}$	
3. $\angle WXZ \cong \angle YZX$	Alt. Int. Angles Thm
4. $\overline{ZX} \cong \overline{ZX}$	Reflexive Prop.
5. $\Delta WXZ \cong \Delta YZX$	SAS

PROOFS USING CPCTC

Complete each proof by filling in the statements.

27. Given: $\overline{NP} \cong \overline{RQ}$ and $\overline{NR} \cong \overline{PQ}$

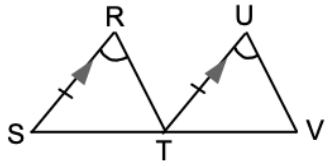
Prove: $\angle N \cong \angle Q$



Statements	Justifications
1.	Given
2.	Given
3.	Reflexive Property of Equality
4.	SSS
5.	CPCTC

28. Given: $\overline{RS} \| \overline{TU}$, $\overline{RS} \cong \overline{TU}$, $\angle SRT \cong \angle TUV$

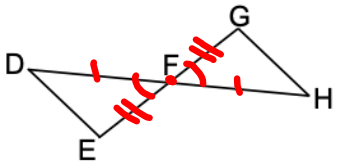
Prove: $\angle STR \cong \angle TVU$



Statements	Justifications
1.	Given
2.	Given
3.	Given
4.	Corresponding Angles Theorem
5.	ASA
6.	CPCTC

~~26.~~ 29. Given: F is the midpoint of $\overline{DH}$
F is the midpoint of $\overline{EG}$

Prove: $\angle DEF \cong \angle HGF$



Statements	Justifications
1. F midpoint $\overline{DH}$	Given
2. F midpoint $\overline{EG}$	Given
3. $\overline{DF} \cong \overline{FH}$	Definition of Midpoint
4. $\overline{EF} \cong \overline{FG}$	Definition of Midpoint
5. $\angle DFE \cong \angle GFH$	Vertical Angles Theorem
6. $\triangle DEF \cong \triangle HGF$	SAS
7. $\angle DEF \cong \angle HGF$	CPCTC