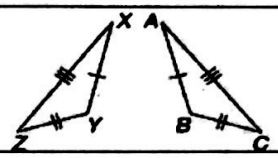
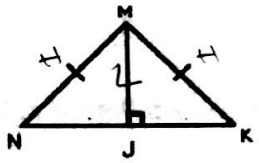
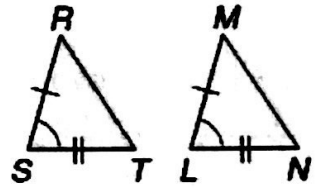
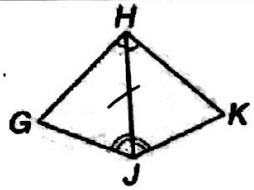
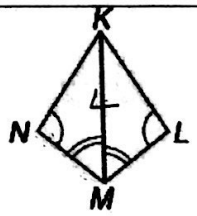
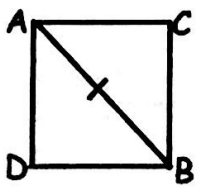
Geometry
Proving Triangle Congruence

Name: _____
Date: _____

Remember the ways to prove triangles are congruent:

Theorem/Postulate	Picture
SSS	
HL	
SAS	
ASA	
AAS	

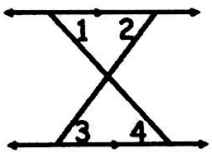
Special properties to remember:

1) 

$\overline{AB} \cong \overline{AB}$ by **Reflexive** Property

2) 

<1 ≅ <2 because Vertical angles are congruent

3) 

<1 ≅ < 4 <2 ≅ < 3 by Alternate Interior Angles Theorem

Corresponding **P**arts of **C**ongruent **T**riangles are **C**ongruent **OR** CPCTC

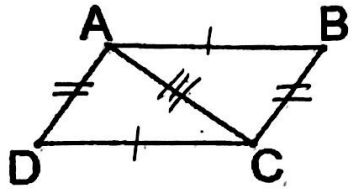
If ΔCAT ≅ ΔDOG, then <A ≅ ∠O because of CPCTC.

If ΔFJH ≅ ΔQRS, then $\overline{JH} \cong \overline{RS}$ and <F ≅ ∠Q because of CPCTC.

PROBLEM #1

Given: $\overline{AB} \cong \overline{CD}$, $\overline{BC} \cong \overline{DA}$

Prove: $\Delta ABC \cong \Delta CDA$

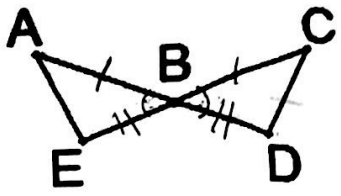


Statements	Reasons
1. $\overline{AB} \cong \overline{CD}$	Given
2. $\overline{BC} \cong \overline{DA}$	Given
3. $\overline{AC} \cong \overline{AC}$	Reflexive Property
4. $\Delta ABC \cong \Delta CDA$	SSS

PROBLEM #2

Given: $\overline{AB} \cong \overline{CB}$, $\overline{EB} \cong \overline{DB}$

Prove: $\Delta ABE \cong \Delta CBD$

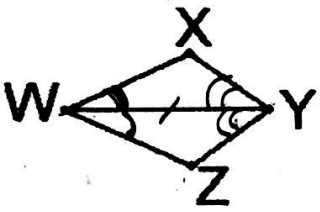


Statements	Reasons
1. $\overline{AB} \cong \overline{CB}$	Given
2. $\overline{EB} \cong \overline{DB}$	Given
3. $\angle ABE \cong \angle CBD$	vertical angles are congruent
4. $\Delta ABE \cong \Delta CBD$	SAS

PROBLEM #3

Given: $\angle XWY \cong \angle ZWY$, $\angle XYW \cong \angle ZYW$

Prove: $\Delta WXY \cong \Delta WZY$

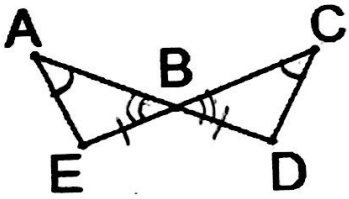


Statements	Reasons
1. $\angle XWY \cong \angle ZWY$	Given
2. $\angle XYW \cong \angle ZYW$	Given
3. $\overline{WY} \cong \overline{WY}$	Reflexive Property
4. $\Delta WXY \cong \Delta WZY$	ASA

PROBLEM #4

Given: $\angle A \cong \angle C$, $\overline{BE} \cong \overline{BD}$

Prove: $\Delta ABE \cong \Delta CBD$

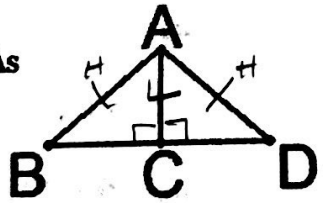


Statements	Reasons
1. $\angle A \cong \angle C$	Given
2. $\overline{BE} \cong \overline{BD}$	Given
3. $\angle ABE \cong \angle CBD$	Vertical angles are congruent
4. $\Delta ABE \cong \Delta CBD$	AAS

PROBLEM #5

Given: ΔABC & ΔADC right Δs, $\overline{AB} \cong \overline{AD}$

Prove: $\Delta ABC \cong \Delta ADC$



Statements	Reasons
1. ΔABC & ΔADC right Δ's	Given
2. $\overline{AB} \cong \overline{AD}$	Given
3. $\overline{AC} \cong \overline{AC}$	Reflexive Property
4. $\Delta ABC \cong \Delta ADC$	HL Postulate

CONGRUENCE PROOFS STEPS:

1. Mark the given.
2. Mark the info implied by given. (reflexive sides, vertical $\angle$'s, etc)
3. Choose a method. (SSS, SAS, ASA, AAS, HL)
4. List the parts.
5. Fill in the reasons. (why did you mark the parts?)
6. *SOON* If you are proving a side or angle is Congruent (rather than just the triangles), then use CPCTC (corresponding parts of congruent triangles are congruent).