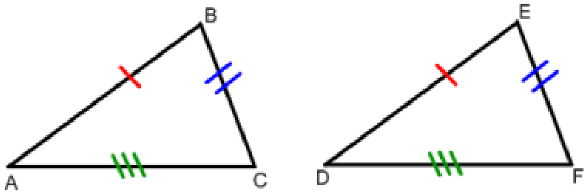
Name: ____ Date: ____________ Math 9/10 Honors

Lesson 2.8 – Triangle Congruence Postulates

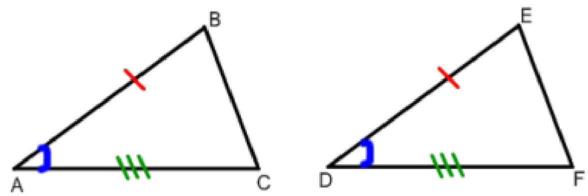
Two triangles are **congruent** if they have corresponding sides that are congruent (have the same length) and corresponding angles that are congruent (same degree measure). We don't have to know all three sides and all three angles, just 3 out of the 6 is enough.

There are 4 methods to prove triangle congruence.

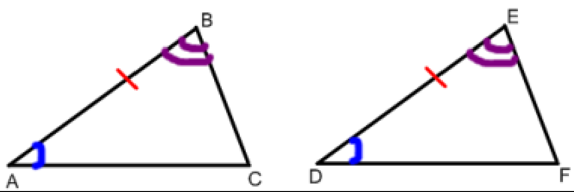
SSS (Side, Side, Side)



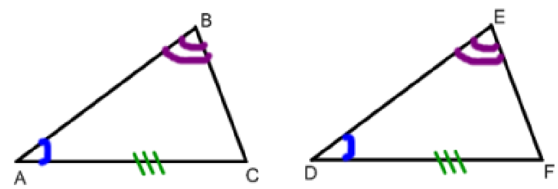
SAS (Side, Angle, Side)



ASA (Angle, Side, Angle)



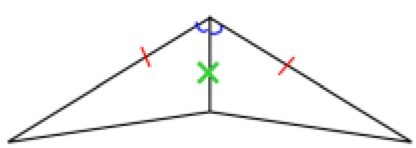
AAS (Angle, Angle, Side)



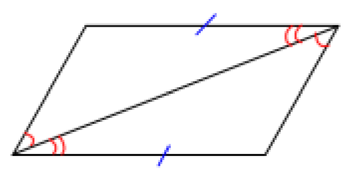
If given a given a right triangle (which has a right angle), then a **hypotenuse and one leg** is enough to justify congruence.

1. Check which congruence postulate you would use to prove that the two triangles are congruent.

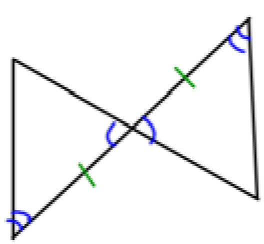
(a)



(b)



(c)



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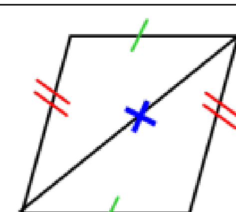
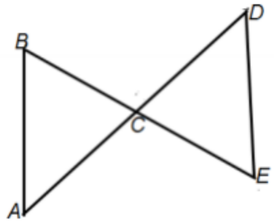


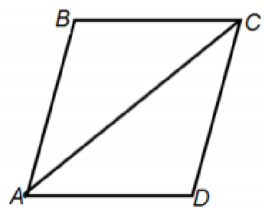
Why doesn't **SSA** or **AAA** work as a triangle congruence postulate?

I. **Given**: C is midpoint of $\overline{BE}$ and $\overline{AD}$.
Prove: $\Delta ABC = \Delta DEC$



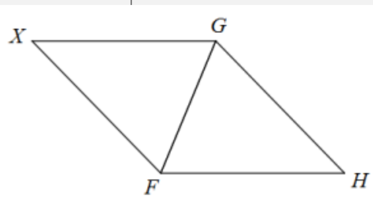
STATEMENTS	REASONS
1. C is midpoint of $\overline{\boldsymbol{BE}}$ and $\overline{\boldsymbol{AD}}$.	1. Given
2. $\overline{\mathbf{BC}} \cong \overline{\mathbf{EC}}$	2. Definition of a midpoint
3.	3. Definition of a midpoint
4.	4.
5. $\mathbf{\Delta ABC = \Delta DEC}$	5.

II. **Given**: $\overline{BC} \cong \overline{DA}$ and $\overline{AC}$ bisects $\angle BCD$.
Prove: $\Delta ABC = \Delta CDA$



STATEMENTS	REASONS
1. $\overline{\boldsymbol{BC}} \cong \overline{\boldsymbol{DA}}$	1. Given
2. $\overline{\boldsymbol{AC}}$ bisects $\angle \boldsymbol{BCD}$.	2. Given
3. $\angle$________ $\cong$ $\angle$_______	3.
4. $\overline{\boldsymbol{AC}} \cong \overline{\boldsymbol{AC}}$	4.
5. $\mathbf{\Delta ABC = \Delta CDA}$	5.

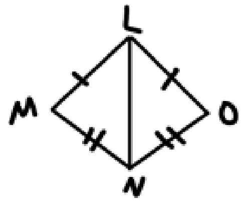
III. **Given**: $\angle X \cong \angle H$ and $\overline{XG} \parallel \overline{FH}$.
Prove: $\Delta XGF \cong \Delta HFG$



STATEMENTS	REASONS
1. $\angle \boldsymbol{X} \cong \angle \boldsymbol{H}$	1. Given
2. $\overline{\boldsymbol{XG}} \parallel \overline{\boldsymbol{FH}}$.	2. Given
3. $\angle \boldsymbol{FGX} \cong \angle \boldsymbol{GFH}$	3.
4.	4.
5. $\mathbf{\Delta XGF \cong \Delta HFG}$	5.

IV. **Given**: $\overline{LM} \cong \overline{LO}$ & $\overline{MN} \cong \overline{ON}$

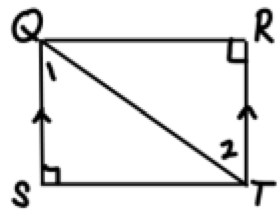
Prove: $\Delta LMN \cong \Delta LON$



STATEMENTS	REASONS
1. $\overline{LM} \cong \overline{LO}$	1. Given
2. $\overline{MN} \cong \overline{ON}$	2. Given
3. $\overline{LN} \cong \overline{LN}$	3.
4. $\Delta LMN \cong \Delta LON$	4.

V. **Given**: $\overline{QS} \parallel \overline{RT}$ and $\angle R \cong \angle S$.

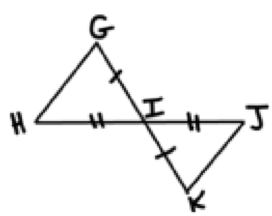
Prove: $\Delta QST \cong \Delta TRQ$



STATEMENTS	REASONS
1. $\overline{QS} \parallel \overline{RT}$	1. Given
2. $\angle R \cong \angle S$	2. Given
3. $\angle 1 \cong \angle 2$	3.
4. $\overline{QT} \cong \overline{QT}$	4.
5. $\Delta QST \cong \Delta TRQ$	5.

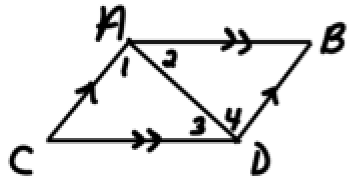
VI. **Given**: $\overline{GI} \cong \overline{KI}$ & $\overline{HI} \cong \overline{JI}$

Prove: $\Delta GIH \cong \Delta KIJ$



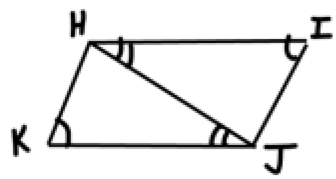
STATEMENTS	REASONS
1. $\overline{GI} \cong \overline{KI}$	1. Given
2. $\overline{HI} \cong \overline{JI}$	2. Given
3. $\angle GIH \cong \angle KIJ$	3.
4. $\Delta GIH \cong \Delta KIJ$	4.

VII. **Given**: $\overline{AC} \parallel \overline{BD}$, $\overline{AB} \parallel \overline{CD}$
Prove: ΔADC ≅ ΔDAB



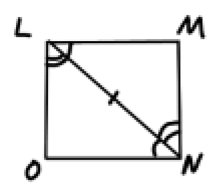
STATEMENTS	REASONS
1. $\overline{AC} \parallel \overline{BD}$, $\overline{AB} \parallel \overline{CD}$	1. Given
2. $\angle 1 \cong \angle 4, \angle 2 \cong \angle 3$	2.
3. $\overline{AD} \cong \overline{AD}$	3.
4. $\Delta ADC \cong$ ΔDAB	4.

VIII. **Given**: $\angle I \cong \angle K$, and $\angle IHJ \cong \angle KJH$
Prove: ΔHJK ≅ ΔJHI



STATEMENTS	REASONS
1. $\angle I \cong \angle K$	1. Given
2. $\angle IHJ \cong \angle KJH$	2.
3. $\overline{HJ} \cong \overline{HJ}$	3.
4. $\Delta HJK \cong$ ΔJHI	4.

IX. **Given**: $\angle MLN \cong \angle ONL$, and $\angle OLN \cong \angle$______
Prove: ΔLNO ≅ ΔNLM



STATEMENTS	REASONS
1. $\angle MLN \cong \angle ONL$	1. Given
2. $\angle OLN \cong \angle$_______	2. Given
3.	3. Reflexive Property
4. $\Delta LNO \cong$ ΔNLM	4.