AMDG

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Note Title Advanced Geometry - 3.5: Overlapping Triangles Date 10/13/2015

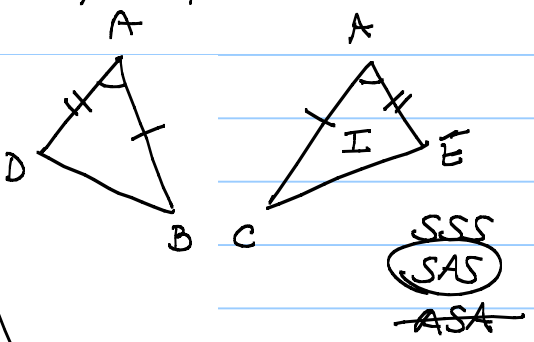
Objective

After studying this section, you will be able to

- Use overlapping triangles in proofs

ORDER:

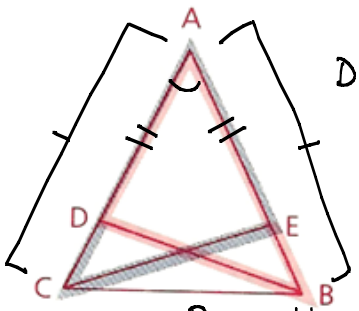
- ≅△ Postulates: SAS, ASA, SSS
- CHRONOLOGY



Problem 1

Given: $\overline{AC} \cong \overline{AB}$, $\overline{AE} \cong \overline{AD}$

Conclusion: $\overline{CE} \cong \overline{BD}$



Proof

Rewrite:

	Statements	Reasons
S	1 $\overline{AC} \cong \overline{AB}$	1
S	2 $\overline{AE} \cong \overline{AD}$	2
A	3 $\angle A \cong \angle A$	3
	4 $\triangle ADB \cong \triangle AEC$	4
	5 $\overline{CE} \cong \overline{BD}$	5

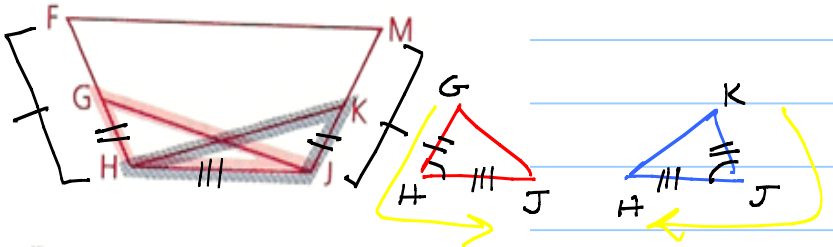
Chronology →

	Statements	Reasons
S	1. $\overline{AC} \cong \overline{AB}$	R 1. Given
A	2. $\angle A \cong \angle A$	2. Reflexive
S	3. $\overline{AE} \cong \overline{AD}$	3. Given
	4. $\triangle AEC \cong \triangle ADB$	4. SAS (123)
	5. $\overline{CE} \cong \overline{BD}$	5. CPCTC (4)

Problem 2

Given: $\overline{FH} \cong \overline{MJ}$;
G is the midpt. of $\overline{FH}$.
K is the midpt. of $\overline{MJ}$.
$\angle GHJ \cong \angle KJH$

Prove: $\overline{GJ} \cong \overline{HK}$



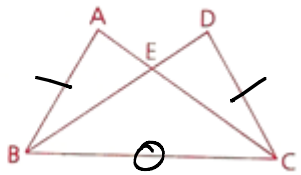
Proof

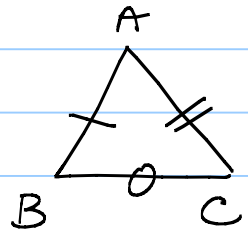
	Statements	Reasons
	1 $\overline{FH} \cong \overline{MJ}$	1 Given
	2 G is the midpt. of $\overline{FH}$.	2 Given
	3 K is the midpt. of $\overline{MJ}$.	3 Given
S	4 $\overline{GH} \cong \overline{KJ}$	4 ÷ or midpt of ≅segs ⇒ ≅segs (123)
A	5 $\angle GHJ \cong \angle KJH$	5 Given
S	6 $\overline{HJ} \cong \overline{HJ}$ ~~$\overline{JH}$~~	6 Reflexive
	7 $\triangle GHJ \cong \triangle KJH$	7 SAS (456)
	8 $\overline{GJ} \cong \overline{HK}$	8 CPCTC (7)

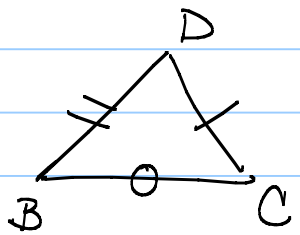
Problem Set A

1 Given: $\overline{AB} \cong \overline{DC}$, $\overline{AC} \cong \overline{DB}$

Prove: $\triangle ABC \cong \triangle DCB$



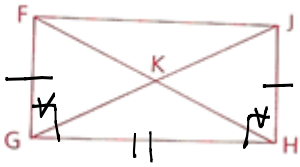


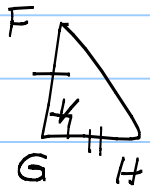


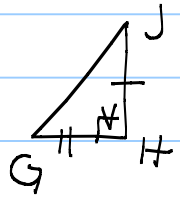
S	R
1. $\overline{AB} \cong \overline{DC}$	1. Given
2. $\overline{AC} \cong \overline{DB}$	2. Given
3. $\overline{BC} \cong \overline{CB}$	3. Ref
4. $\triangle ABC \cong \triangle DCB$	4. SSS (123)

2 Given: $\angle FGH$ is a right $\angle$.
$\angle JHG$ is a right $\angle$.
$\overline{FG} \cong \overline{JH}$

Prove: $\triangle FGH \cong \triangle JHG$







S	R
S 1. $\overline{FG} \cong \overline{JH}$	1. Given
2. $\angle FGH$ & $\angle JHG$ rt $\angle$s	2. Given
A 3. $\angle FGH \cong \angle JHG$	3. Rt $\angle$s $\Rightarrow \cong \angle$s (2)
S 4. $\overline{GH} \cong \overline{HG}$	4. Reflexive
5. $\triangle FGH \cong \triangle JHG$	5. SAS (134)