Geometry Practice: G.G.28 #8

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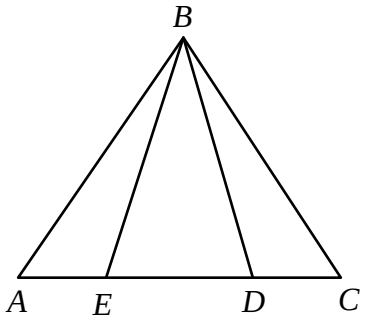
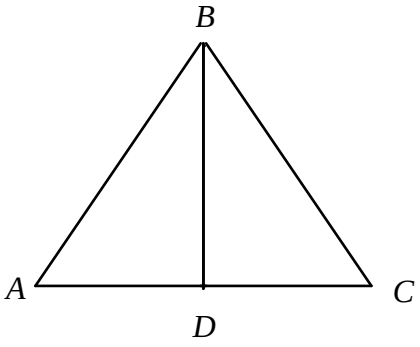
P.I. G.G.28: Determine the congruence of two triangles by using one of the five congruence techniques (SSS, SAS, ASA, AAS, HL), given sufficient information about the sides and/or angles of two congruent triangles

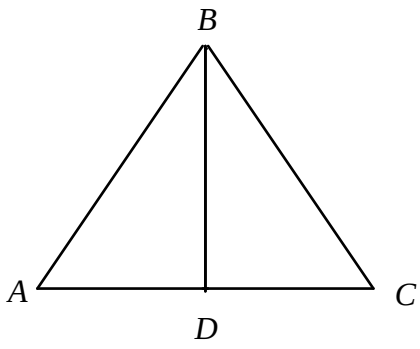
1. Given: $\overline{BE} \cong \overline{ED}$; $\overline{AE} \cong \overline{CD}$
   Prove: ΔABC is isosceles



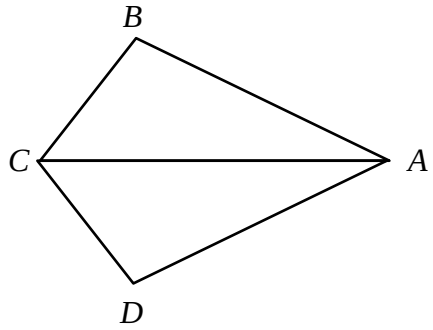
2. Given: $\overline{BD}$ bisects $\overline{AC}$, $\overline{AB} \cong \overline{BC}$
   Prove: $\angle C \cong \angle A$



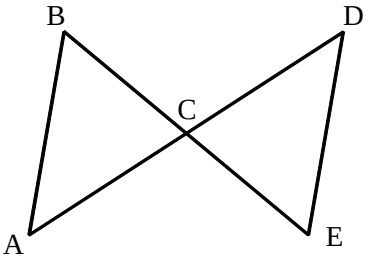
3. Given: $\overline{BD}$ is the median to $\overline{AC}$, $\overline{AB} \cong \overline{BC}$
   Prove: $\angle CBD \cong \angle ABD$



4. Given: $\angle DCA \cong \angle BCA$, $\angle B \cong \angle D$
   Prove: $\overline{AB} \cong \overline{AD}$



5. Given: $\overline{BC} \cong \overline{EC}$ and $\overline{AC} \cong \overline{DC}$
   Prove: $\overline{BA} \cong \overline{ED}$



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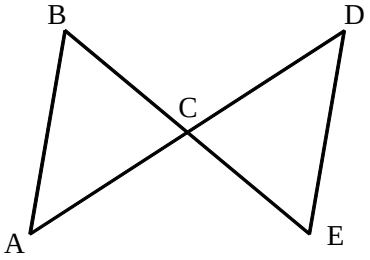
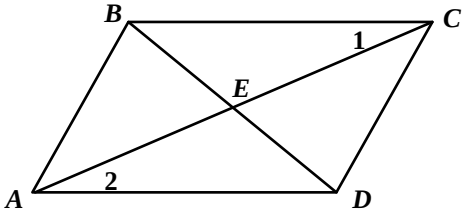
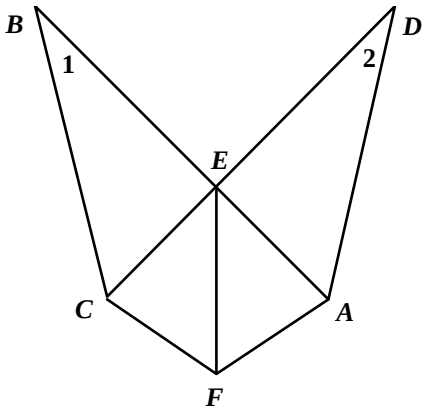
6. Given: $\angle A \cong \angle D$ and $\overline{AC} \cong \overline{DC}$
   Prove: $\overline{BC} \cong \overline{EC}$



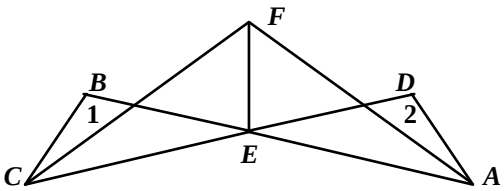
7. Given: $\overline{BC} \cong \overline{DA}$, $\angle 1 \cong \angle 2$. Prove: $\Delta BEA \cong \Delta DEC$.



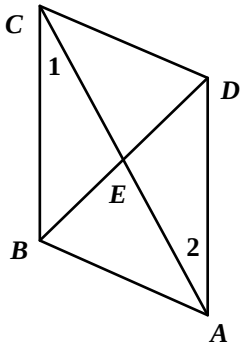
8. Given:
   $\overline{BC} \cong \overline{DA}$, $\angle 1 \cong \angle 2$, and $\overline{CF} \cong \overline{AF}$.
   Prove: $\Delta CEF \cong \Delta AEF$.



9. Given:
   $\overline{BC} \cong \overline{DA}$, $\angle 1 \cong \angle 2$, and $\overline{CF} \cong \overline{AF}$.
   Prove: $\Delta CEF \cong \Delta AEF$.



10. Given: $\overline{BC} \cong \overline{DA}$, $\angle 1 \cong \angle 2$. Prove: $\Delta BEA \cong \Delta DEC$.



	1. $\overline{BE} \cong \overline{BD}$	1. Given
	2. $\angle BED \cong \angle BDE$	2. If 2 sides of a Δ are $\cong$, the $\angle$s opp. are $\cong$.
	3. $\angle BEA \cong \angle BDC$	3. If $\angle$s are supp. to $\cong$ $\angle$s, they are $\cong$.
	4. $\overline{AE} \cong \overline{CD}$	4. Given
	5. $\Delta ABE \cong \Delta CBD$	5. SAS
	6. $\overline{AB} \cong \overline{CB}$	6. CPCTC
[1]	7. ΔABC is isosceles	7. If at least 2 sides of a Δ are $\cong$, the Δ is isosc.

	1. $\overline{BD}$ bisects $\overline{AC}$, $\overline{AB} \cong \overline{BC}$	1. Given
	2. $\overline{AD} \cong \overline{CD}$	2. Definition of a bisector
	3. $\overline{BD} \cong \overline{BD}$	3. Reflexive
	4. $\Delta ADB \cong \Delta CDB$	4. SSS
[2]	5. $\angle C \cong \angle A$	5. CPCTC

	1. $\overline{BD}$ is the median to $\overline{AC}$, $\overline{AB} \cong \overline{BC}$	1. Given
	2. $\overline{AD} \cong \overline{CD}$	2. Definition of a median
	3. $\overline{BD} \cong \overline{BD}$	3. Reflexive
	4. $\Delta ADB \cong \Delta CDB$	4. SSS
[3]	5. $\angle CBD \cong \angle ABD$	5. CPCTC

	1. $\angle DCA \cong \angle BCA$, $\angle B \cong \angle D$	1. Given
	2. $\overline{AC} \cong \overline{AC}$	2. Reflexive
	3. $\Delta ABC \cong \Delta ADC$	3. AAS
[4]	4. $\overline{AB} \cong \overline{AD}$	4. CPCTC

	1. $\overline{BC} \cong \overline{EC}$ $\overline{AC} \cong \overline{DC}$	1. Given
	2. $\angle BCA \cong \angle ECD$	2. Vertical Angles
	3. $\Delta BCA \cong \Delta ECD$	3. SAS
[5]	4. $\overline{BA} \cong \overline{ED}$	4. CPCTC

	1. $\angle A \cong \angle D$ $\overline{AC} \cong \overline{DC}$	1. Given
	2. $\angle BCA \cong \angle ECD$	2. Vertical Angles
	3. $\Delta BCA \cong \Delta ECD$	3. ASA
[6]	4. $\overline{BC} \cong \overline{EC}$	4. CPCTC

[7] $\angle BEC \cong \angle DEA$ by vertical angles. $\Delta BEC \cong \Delta DEA$ by AAS. Then by CPCTC, $\overline{BE} \cong \overline{DE}$, and $\overline{AE} \cong \overline{CE}$. $\angle BEA \cong \angle DEC$ by vertical angles, so $\Delta BEA \cong \Delta DEC$ by SAS.

[8] $\angle BEC \cong \angle DEA$ by vertical angles. $\Delta BEC \cong \Delta DEA$ by AAS. Then by CPCTC, $\overline{CE} \cong \overline{AE}$. $\overline{EF} \cong \overline{EF}$ by the Reflexive Property. So $\Delta CEF \cong \Delta AEF$ by SSS.

[9] $\angle BEC \cong \angle DEA$ by vertical angles. $\Delta BEC \cong \Delta DEA$ by AAS. Then by CPCTC, $\overline{CE} \cong \overline{AE}$. $\overline{EF} \cong \overline{EF}$ by the Reflexive Property. So $\Delta CEF \cong \Delta AEF$ by SSS.

[10] $\angle BEC \cong \angle DEA$ by vertical angles. $\Delta BEC \cong \Delta DEA$ by AAS. Then by CPCTC, $\overline{BE} \cong \overline{DE}$, and $\overline{AE} \cong \overline{CE}$. $\angle BEA \cong \angle DEC$ by vertical angles, so $\Delta BEA \cong \Delta DEC$ by SAS.