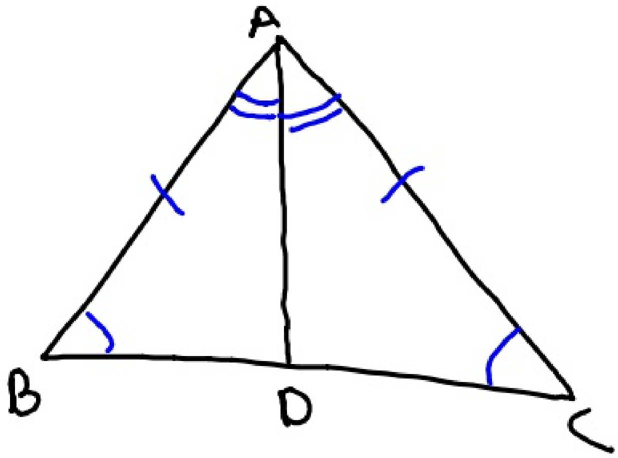
5-14-19 5th Geo

Given: $AB = AC$

$\overline{AD}$ bisects $\angle BAC$

Prove: $BD = DC$



Statement	Justification
① $AB = AC$	① Given
② $\angle B = \angle C$	② Opposite ∠'s in an isosceles △ are =.
③ $\overline{AD}$ bisects $\angle BAC$	③ Given
④ $\angle BAD = \angle CAD$	④ Def. of bisection
⑤ $\triangle BAD \cong \triangle CAD$	⑤ ASA
⑥ $BD = DC$	⑥ CPCTC

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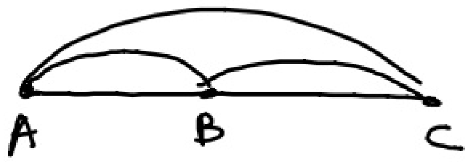
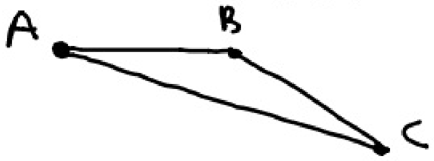
True or False

$\overline{AB}+\overline{BC}=\overline{AC}$



← Betweenness of Points

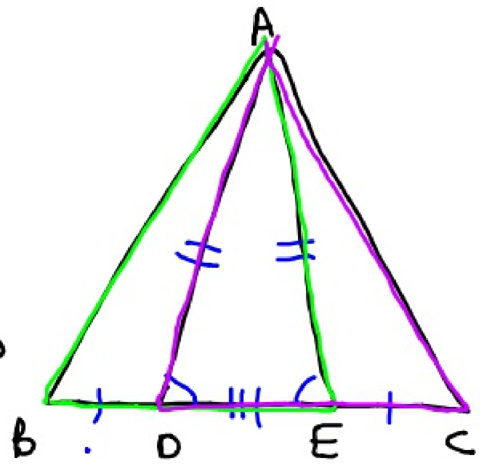
BUT



Given: $BD=EC$

$AD=AE$

Prove: $\triangle BAE=\triangle CAD$



Statement	Justification
① $BD=EC$	① Given
② $AD=AE$	② Given
③ $\angle ADE=\angle AED$	③ If two sides of a $\triangle$ are =, opp. $\angle$'s are =.
④ $DE=DE$	④ Reflexive
⑤ $BE=BD+DE$	⑤ Betweenness of Pts.
⑥ $CD=CE+DE$	⑥ Betweenness of Pts.
⑦ $BD+DE=CE+DE$	⑦ Simple addition (lines 1 & 4)
⑧ $BE=CD$	⑧ Substitution (lines 5 & 6)
⑨ $\triangle BAE=\triangle CAD$	⑨ SAS

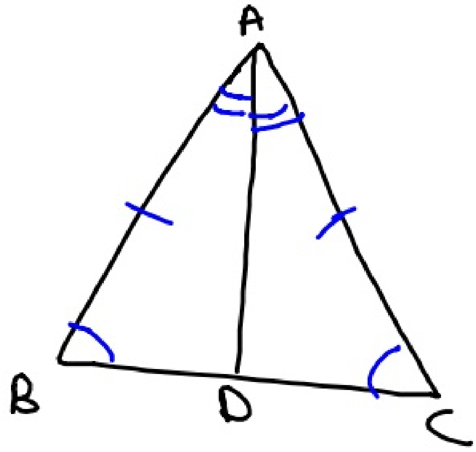
5-14-19 6th Geo

DON'T USE REFLEXIVE IN THIS PROBLEM

Given: $AB = AC$

$\overline{AD}$ bisects $\angle BAC$

Prove: $BD = DC$



Statement	Justification
① $AB = AC$	① Given
② $\angle B = \angle C$	② If two sides of a $\triangle$ are =, opposite $\angle$'s are =.
③ $\overline{AD}$ bisects $\angle BAC$	③ Given
④ $\angle BAD = \angle CAD$	④ Definition of bisection
⑤ $\triangle BAD \cong \triangle CAD$	⑤ ASA
⑥ $BD = DC$	⑥ CPCTC

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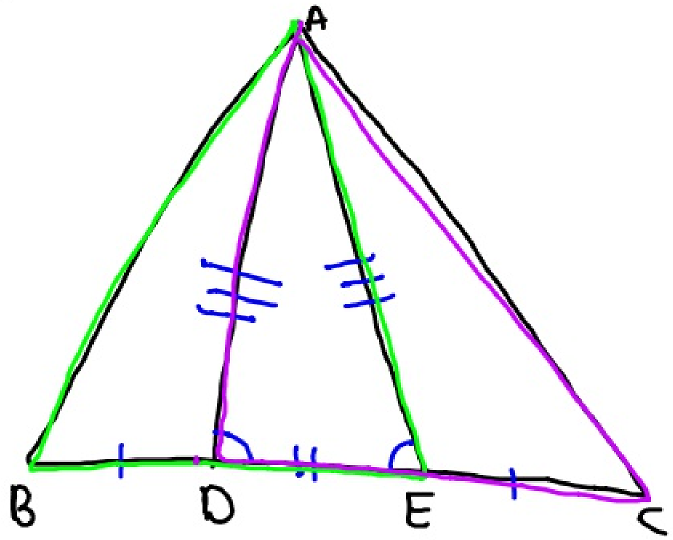
Given: $BD = EC$

$AD = AE$

Prove: $\triangle BAE \cong \triangle CAD$



Statement	Justification
① $BD = EC$	① Given
② $DE = DE$	② Reflexive
③ $BD + DE = EC + DE$	③ Simple addition of lines 1 and 2.
④ $BE = BD + DE$	④ Betweenness of Pts.
⑤ $CD = EC + DE$	⑤ Betweenness of Pts.
⑥ $BE = CD$	⑥ Substitution (lines 3, 4, 5)
⑦ $AD = AE$	⑦ Given
⑧ $\angle ADE = \angle AED$	⑧ If 2 sides of a $\triangle$ are $=$, opp. $\angle$'s are $=$.
⑨ $\triangle BAE \cong \triangle CAD$	⑨ SAS

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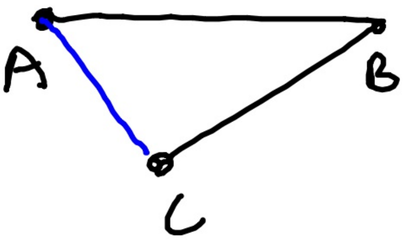
$$\overline{AB} + \overline{BC} = \overline{AC}$$



B is on $\overline{AC}$, then

$$\overline{AB} + \overline{BC} = \overline{AC}$$

Betweenness of Points