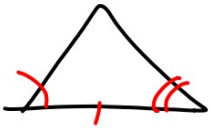
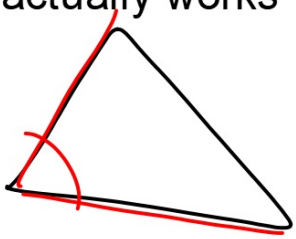
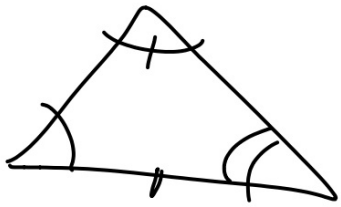
Geometry 4.5



Use the ASA postulate to test congruence
Use the AAS postulate to test congruence
Prove triangle congruence using ASA and AAS
Test whether SSA theorem actually works



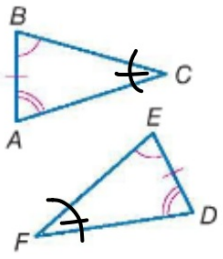


included angle
included side
activity: whiteboards
scrambled proofs

Postulate 4.3 Angle-Side-Angle (ASA) Congruence

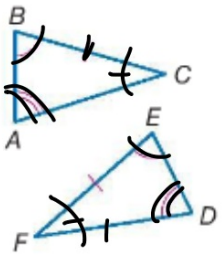
If two angles and the included side of one triangle are congruent to two angles and the included side of another triangle, then the triangles are congruent.

Example If **A**ngle $\angle A \cong \angle D$,
Side $\overline{AB} \cong \overline{DE}$, and
Angle $\angle B \cong \angle E$,
then $\triangle ABC \cong \triangle DEF$.



Theorem 4.5 Angle-Angle-Side (AAS) Congruence

If two angles and the nonincluded side of one triangle are congruent to the corresponding two angles and side of a second triangle, then the two triangles are congruent.



Example If Angle $\angle A \cong \angle D$,
Angle $\angle B \cong \angle E$, and
Side $\overline{BC} \cong \overline{EF}$,
then $\triangle ABC \cong \triangle DEF$.

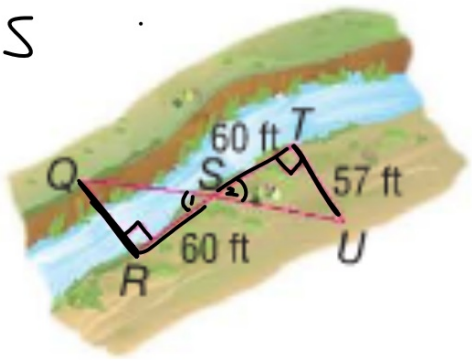
15. NATURE What is the approximate width of the creek shown below? Explain your reasoning.

(Lesson 4-5) 57 ft

$\triangle QRS \cong \triangle UTS$

by. ASA

CPCTC



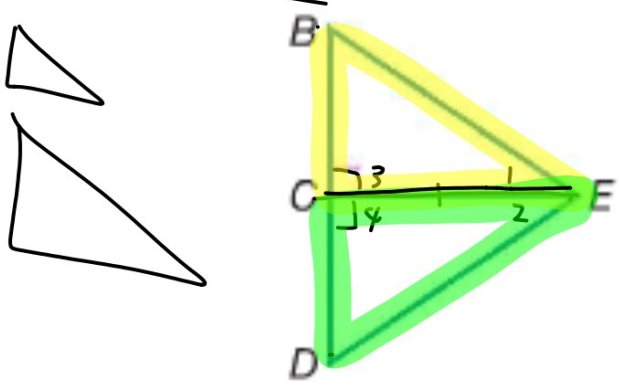
SSA? Why not?
Use a given angle and two lengths:
Build a triangle
The angle is not the included angle.

SSA no guarantee of 2 $\cong$ Δs

ASA

6. Given: $\overline{CE}$ bisects $\angle BED$; $\angle BCE$ and $\angle ECD$ are right angles.

Prove: $\triangle ECB \cong \triangle ECD$

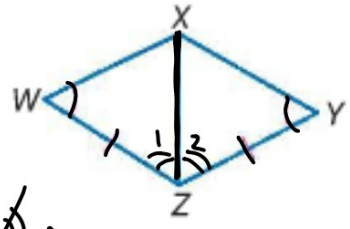


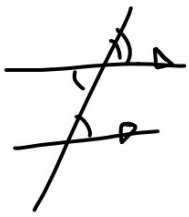
1. CE bisects ∠BED, ∠BCE and ∠ECD are rt ∠s	1. given
2. ∠1 ≅ ∠2	2. def bisect
3. ∠3 ≅ ∠4	3. 90's =
4. $\overline{CE} \cong \overline{CE}$	4. refl
5. △ECB ≅ △ECD	ASA

ASA

7. Given: $\angle W \cong \angle Y$, $\overline{WZ} \cong \overline{YZ}$, $\overline{XZ}$ bisects $\angle WZY$.

Prove: $\triangle XWZ \cong \triangle XYZ$





1. $\angle W \cong \angle Y$ $\overline{WZ} \cong \overline{YZ}$ $\overline{XZ}$ bis $\angle WZY$	1. given
2. $\angle 1 \cong \angle 2$	2. def bis.
3. $\triangle XWZ \cong \triangle XYZ$	3. ASA

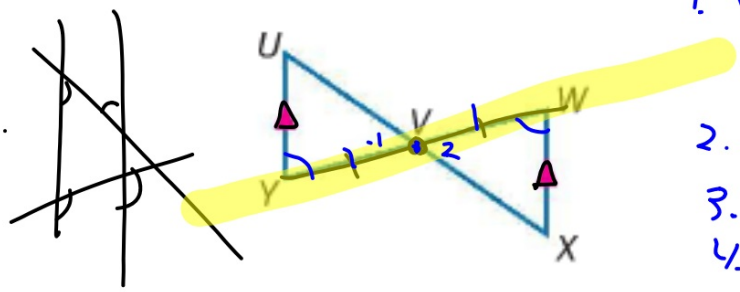
Scrambled proofs:

ASA

PROOF Write a two-column proof.

9 **Given:** V is the midpoint of $\overline{YW}$; $\overline{UY} \parallel \overline{XW}$.

Prove: $\triangle UVY \cong \triangle XVW$



1. V is mp $\overline{UY} \parallel \overline{XW}$	1. given
2. $\overline{YV} \cong \overline{WV}$	2. def mp
3. $\angle Y \cong \angle U$	3. AIA
4. $\angle 1 \cong \angle 2$	4. VA
5. $\triangle UVY \cong \triangle XVW$	6. ASA

10. **Given:** $\overline{MS} \cong \overline{RQ}$, $\overline{MS} \parallel \overline{RQ}$

Prove: $\triangle MSP \cong \triangle RQP$