

Geometry

Ch. 4 Handout 4.3

Triangle Congruence by ASA and AAS

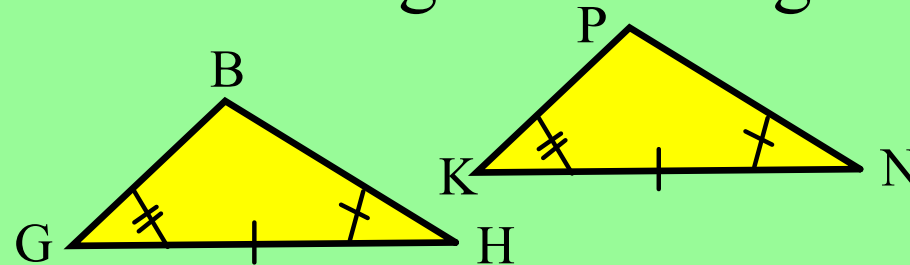
Ways to prove triangles congruent



Angle-Side-Angle (ASA) Postulate

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

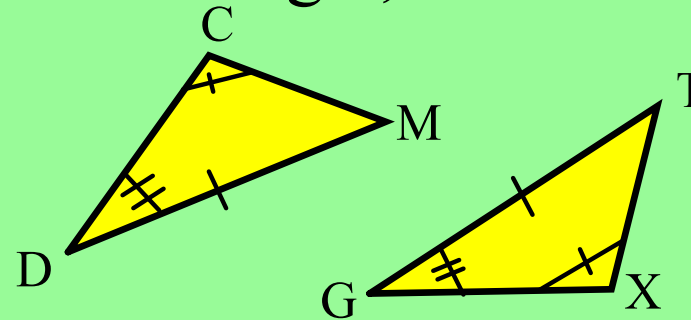
$$\triangle \underline{BGH} \cong \triangle \underline{PKN}$$



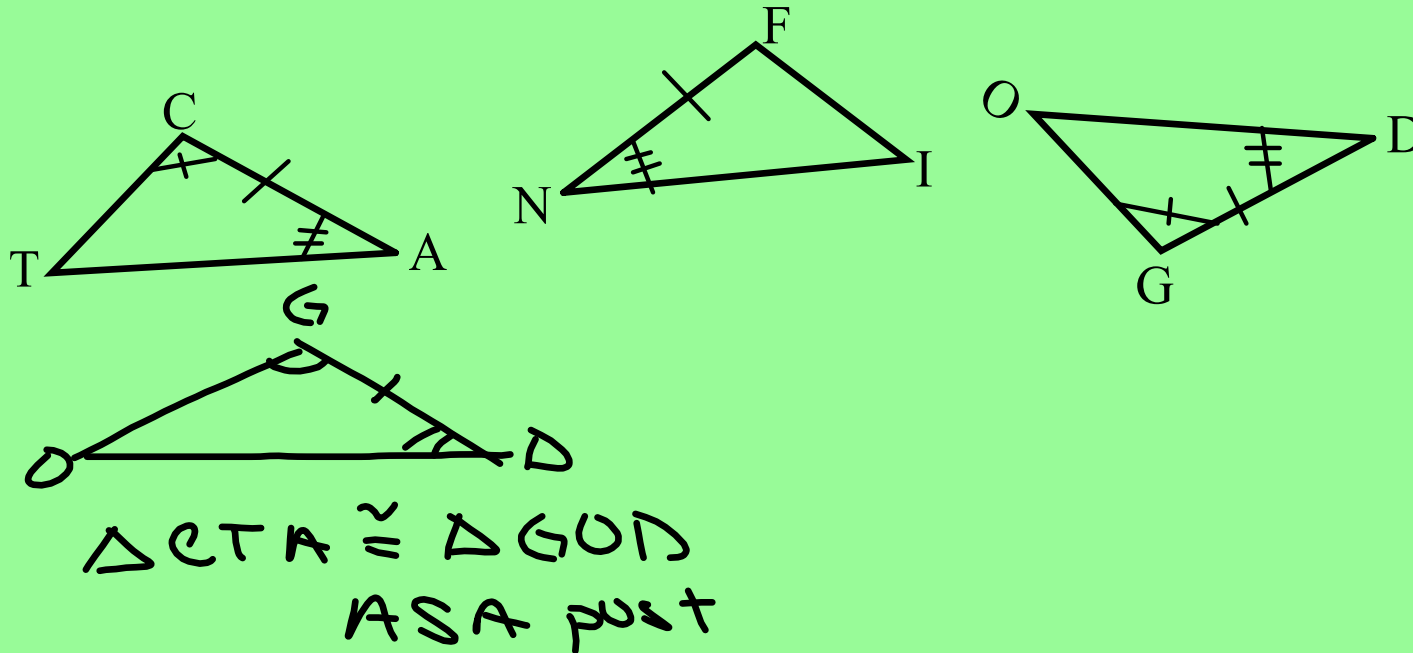
Angle-Angle-Side (AAS) Theorem

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

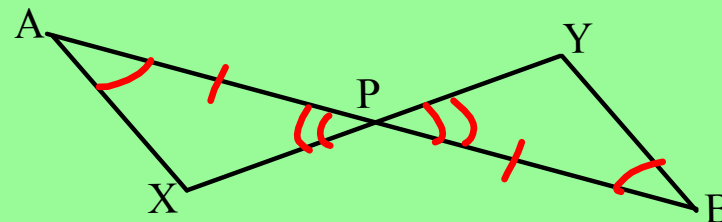
$$\triangle \underline{CDM} \cong \triangle \underline{XGT}$$



1. Name two triangles that are congruent by the ASA Postulate.

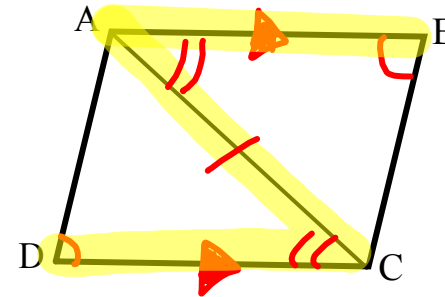


2. Given: $\angle A \cong \angle B$, $\overline{AP} \cong \overline{BP}$
 Prove: $\triangle APX \cong \triangle BPY$



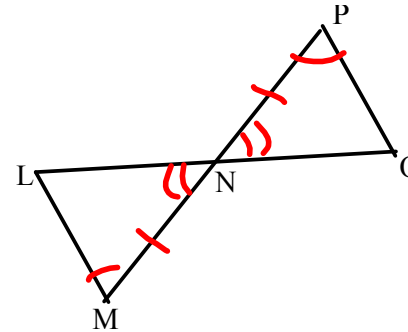
Statements	Reasons
① $\angle A \cong \angle B$, $\overline{AP} \cong \overline{BP}$	① Given
② $\angle APX \cong \angle BPY$	② Vert \angle 's \cong
③ $\triangle APX \cong \triangle BPY$	③ ASA post.

3. Given: $\angle B \cong \angle D$, $\overline{AB} \parallel \overline{CD}$
 Prove: $\triangle ABC \cong \triangle CDA$



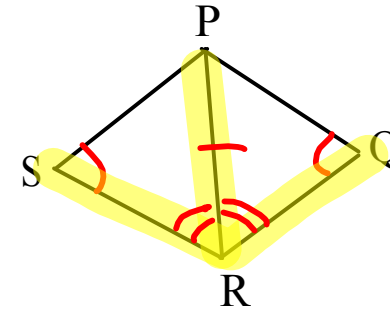
Statement	Reasons
① $\angle B \cong \angle D$; $\overline{AB} \parallel \overline{CD}$	① Given
② $\angle BAC \cong \angle ACD$	② If 11 lines alt int \angle s \cong
③ $\overline{AC} \cong \overline{AC}$	③ Reflexive prop \cong
④ $\triangle ABC \cong \triangle CDA$	④ AAS thm

4. Given: $\overline{NM} \cong \overline{NP}$, $\angle M \cong \angle P$
 Prove: $\triangle NML \cong \triangle NPO$



Statement	Reasons
① $\overline{NM} \cong \overline{NP}$, $\angle M \cong \angle P$	① Given
② $\angle LNM \cong \angle ONP$	② Vert \angle 's \cong
③ $\triangle NML \cong \triangle NPO$	③ ASA post

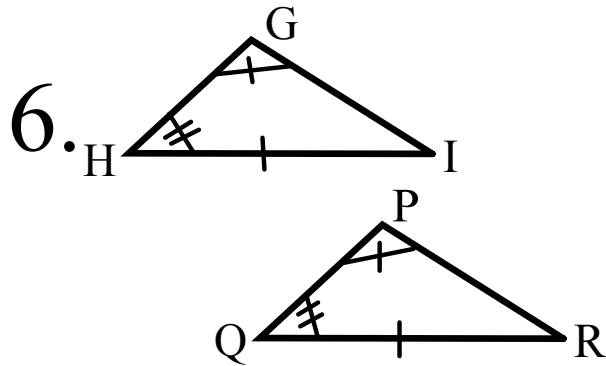
5. Given: $\angle S \cong \angle Q$, \overline{RP} bisects $\angle SRQ$.
 Prove: $\triangle SRP \cong \triangle QRP$



Statements	Reasons
① $\angle S \cong \angle Q$; \overline{RP} bisects $\angle SRQ$	① Given
② $\angle SRP \cong \angle QRP$	② defn of \angle bisector
③ $\overline{PR} \cong \overline{PR}$	③ Reflexive prop \cong
④ $\triangle SRP \cong \triangle QRP$	④ AAS thm.

Tell whether you can prove the triangles congruent by ASA or AAS.

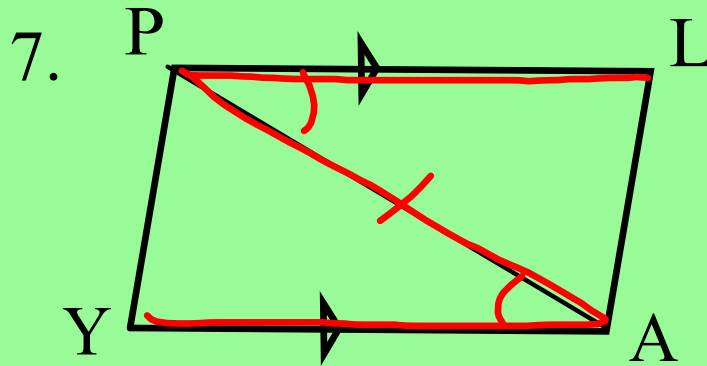
If you can, state a triangle congruence and the postulate or theorem you used. If not, write not possible.



AAS thm

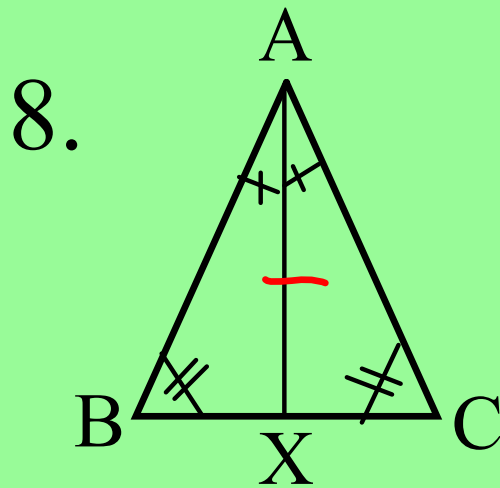
$$\triangle GHI \cong \triangle PQR$$

Tell whether you can prove the triangles congruent by ASA or AAS. If you can, state a triangle congruence and the postulate or theorem you used. If not, write not possible.



Δ 's are not \cong

Tell whether you can prove the triangles congruent by ASA or AAS. If you can, state a triangle congruence and the postulate or theorem you used. If not, write not possible.



AAS thm
 $\triangle ABX \cong \triangle ACX$

Assignments:

Pgs 215-218 1-7,9-16, 21-23