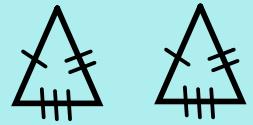
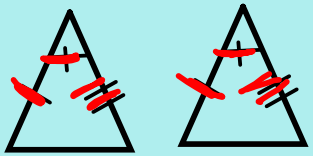
Geometry

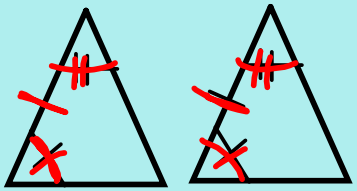
Ch. 4 Handout 4.2

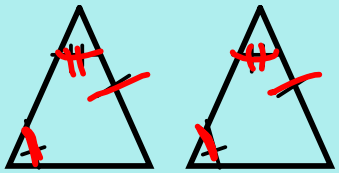
Triangles Congruence by SSS and SAS

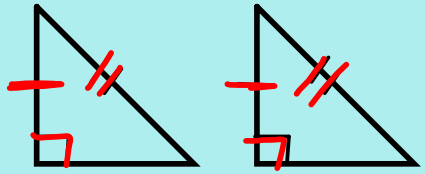
Ways to Prove Triangles Congruent

1. SSS Postulate  Pull

2. SAS Postulate (include ∠)  Pull

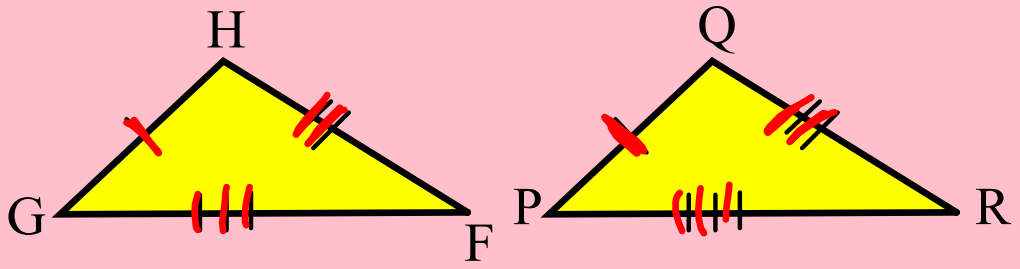
3. ASA Postulate (include side)  Pull

4. AAS Postulate (non-include side)  Pull

5. HL Theorem  Pull

Side-Side-Side (SSS) Postulate

If the three sides of one triangle are congruent to the three sides of another triangle, then the two triangles are congruent.

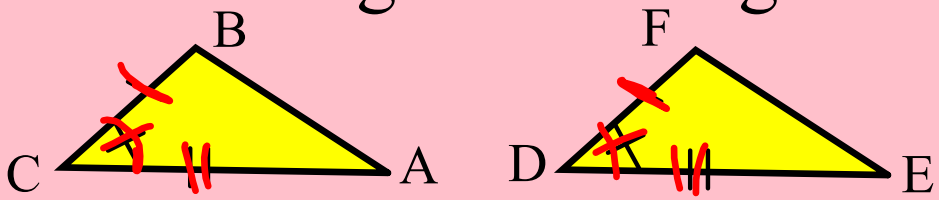


$\triangle GHF \cong \triangle PQR$

Side-Angle-Side (SAS) Postulate

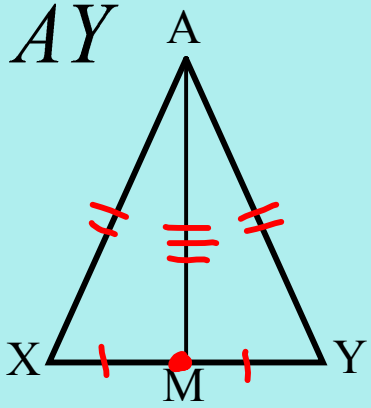
If two sides and the included angle of one triangle are congruent to two sides and the included angle of another triangle, then the two triangles are congruent.

Δ BCA $\cong \Delta$ FDE



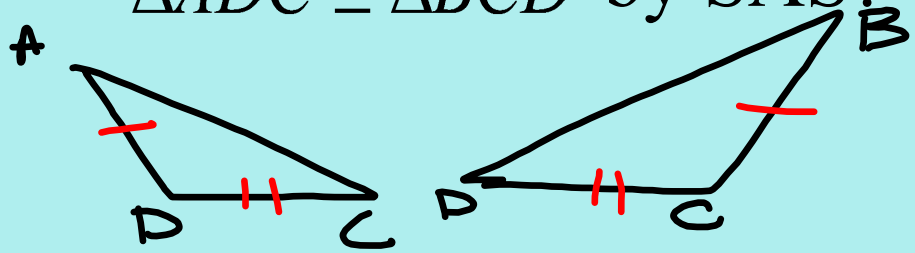
1. Given: M is the midpoint of $\overline{XY}$, $\overline{AX} \cong \overline{AY}$

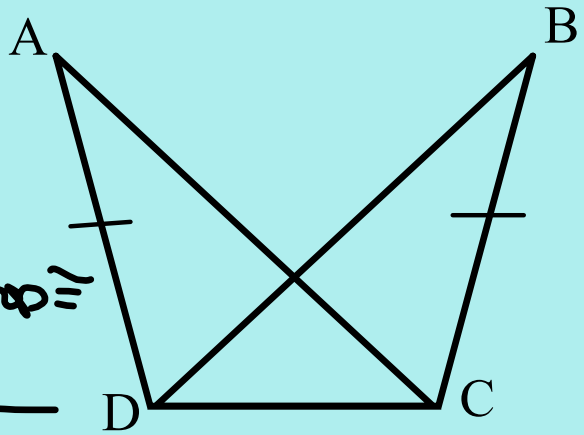
   Prove: $\Delta AMX \cong \Delta AMY$



Statements	Reasons
(1) M is the midpt of $\overline{XY}$	(1) Given
$\overline{AX} \cong \overline{AY}$	
(2) $\overline{XM} \cong \overline{MY}$	(2) defn of midpt
(3) $\overline{AM} \cong \overline{AM}$	(3) Reflexive prop. $\cong$
(4) $\Delta AMX \cong \Delta AMY$	(4) SSS post.

2. What other information do you need to prove $\Delta ADC \cong \Delta BCD$ by SAS?



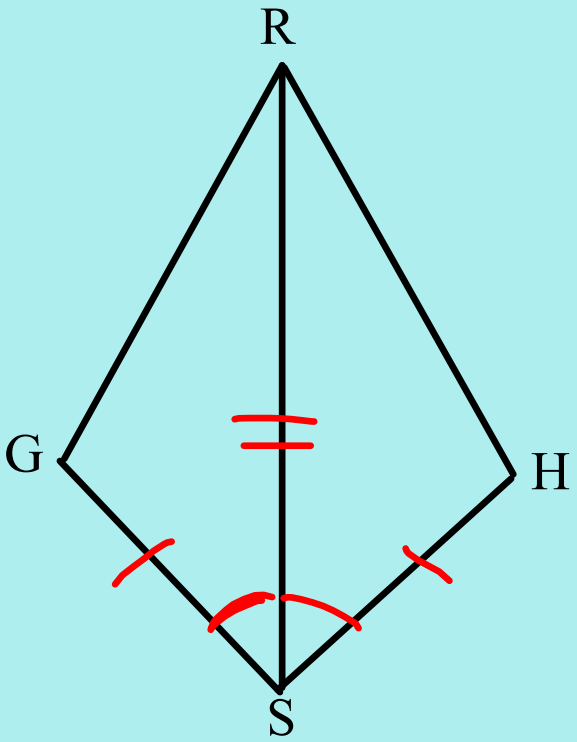


$\overline{DC} \cong \overline{DC}$ Reflexive prop $\cong$

$\angle ADC \cong \angle BCD$ — to use SAS post

Given: $\angle RSG \cong \angle RSH$, $\overline{SG} \cong \overline{SH}$

From the information given, can you prove $\triangle RSG \cong \triangle RSH$? Explain.

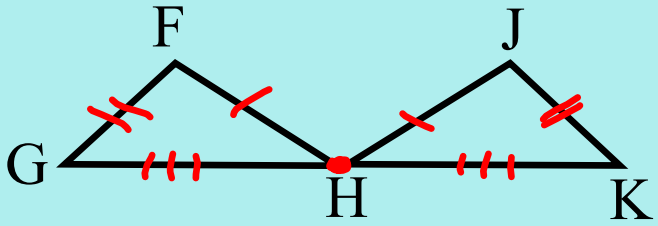


$\overline{SR} \cong \overline{SR}$ Reflexive prop $\cong$

$\triangle RSG \cong \triangle RSH$ SAS post

4. Given: $\overline{HF} \cong \overline{HJ}, \overline{FG} \cong \overline{JK}$

H is the midpoint of $\overline{GK}$.

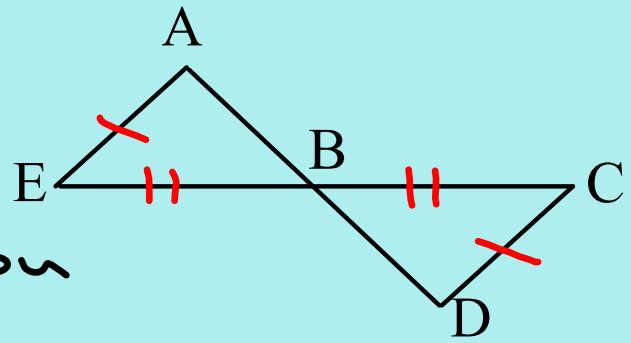


Prove: $\Delta FGH \cong \Delta JKH$

Statements	Reasons
① $\overline{HF} \cong \overline{HJ}$, $\overline{FG} \cong \overline{JK}$; H is midpt of $\overline{GK}$	① Given
② $\overline{GH} \cong \overline{HK}$	② defn of midpt
③ $\Delta GFH \cong \Delta KJH$	③ SSS post.

6. From the information given, can you prove $\Delta AEB \cong \Delta DCB$? Explain.

Given: $\overline{AE} \cong \overline{DC}, \overline{EB} \cong \overline{CB}$

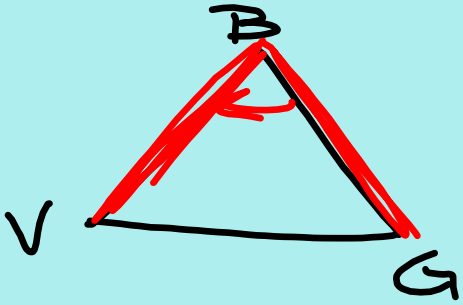


Cannot use SSS because you cannot prove $\overline{AB} \cong \overline{BD}$.

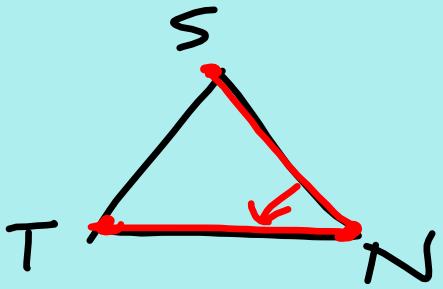
Cannot use SAS because you cannot prove include $\angle$'s $\cong$ so therefore Δ's cannot be prove $\cong$.

7. In ΔVGB, which sides include $\angle B$?

Sides: $\overline{BV}$ and $\overline{BG}$

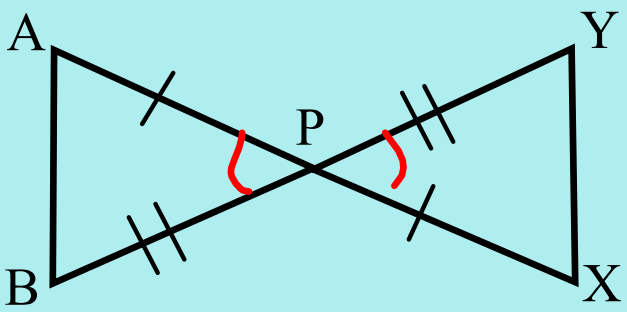


8. In ΔSTN , which angle is included between $\overline{NS}$ and $\overline{TN}$?



$\measuredangle N$

9. Which triangles can you prove congruent? Tell whether you would use the SSS or SAS Postulate?

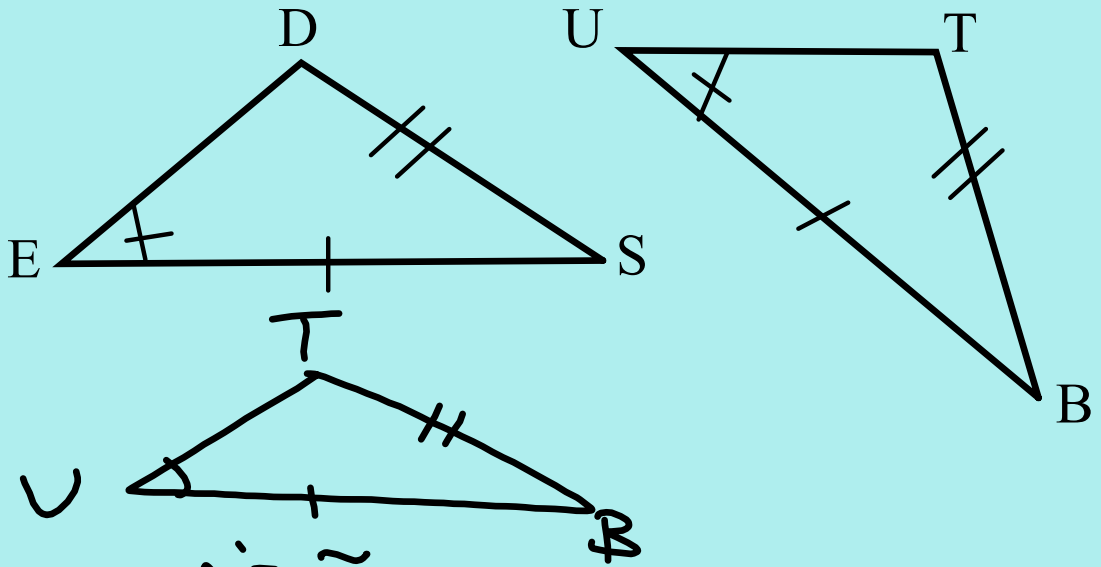


SAS Post

$\angle APB \cong \angle XPY$ Vert $\angle$'s $\cong$

$\triangle APB \cong \triangle XPY$ SAS post

10. Can you prove $\Delta SED \cong \Delta BUT$ from the information given? Explain.



Cannot prove Δ's ≅.
Can't prove include ∠ to use SAS.
Can't prove 3rd sides ≅ to use SSS.

Assignment:

Day 1: Pgs 208-211 1-9 odds, 10-13 all, 15-27 odds, 29, 39,41