South Geo - Day 7 Notes

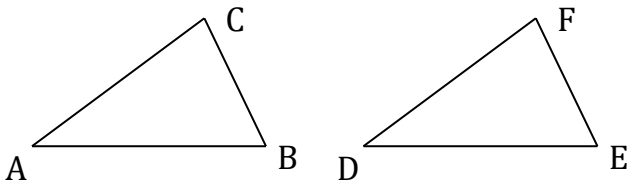
4.4 TRIANGLE CONGRUENCE AND BEYOND... CPCTC

❒ 4.4 Target: Prove parts of corresponding triangles are congruent

Warm Up: List ALL the ways you know how to prove △'s congruent.

SAS, SSS, ASA, AAS, HL

Once we have proven Δ's congruent, we can draw **NEW** conclusions and use a new **REASON**!



If $\Delta ABC \cong \Delta DEF$ **...**then what else can we say:

any other corresponding parts ≅

For example, if △'s ≅ by SSS, we can now prove all the ∠'s ≅ by...

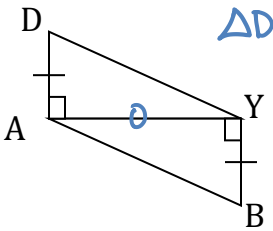
New Reason for Proving Parts Congruent: C P C T C

Corresponding parts of ≅ △'s are congruent

Remember, you MUST always prove Triangles BEFORE using CPCTC

Directions: Use the marked diagram to state the method used to prove the triangles congruent. Name the additional corresponding parts that could then be concluded to be congruent.

1)



△DAY ≅ △BYA by SAS...

Now we can say

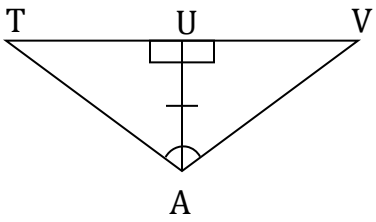
① ∠DYA ≅ ∠BAY

② $\overline{DY} \cong \overline{BA}$

③ ∠D ≅ ∠B

By CPCTC

2)



△TUA ≅ △VUA by ASA

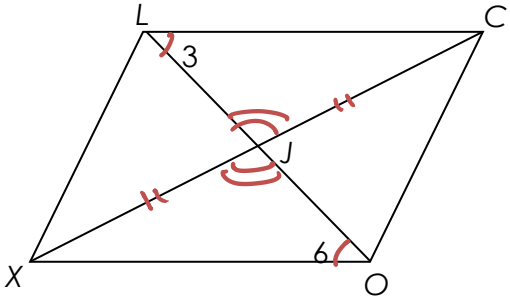
Now we can say

① $\overline{TU} \cong \overline{UV}$ ② ∠T ≅ ∠V ③ $\overline{TA} \cong \overline{AV}$

By CPCTC

Ex 1 Given: J is the midpoint of $\overline{XC}$
$\angle 3 \cong \angle 6$

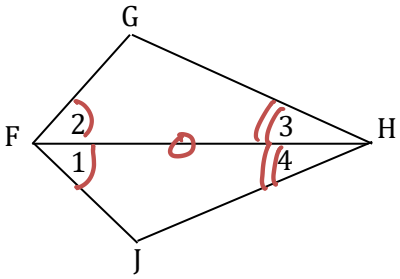
Prove: $\overline{LC} \cong \overline{XO}$



① J is midpt of $\overline{XC}$	① Given
② $\angle 3 \cong \angle 6$	② Given
③ $\overline{XJ} \cong \overline{CJ}$	③ MIDPOINT Def'n
④ $\angle LJC \cong \angle OJX$	④ Vertical $\angle$s $\cong$.
⑤ $\triangle LJC \cong \triangle OJX$	⑤ AAS
⑥ $\overline{LC} \cong \overline{XO}$	⑥ CPCTC

Ex. 2 Given: $\overline{HF}$ bisects $\angle GFJ$ and $\angle GHJ$

Prove: $\overline{GH} \cong \overline{JH}$

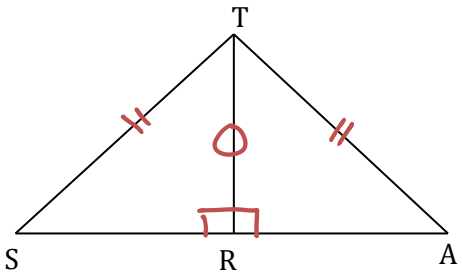


① $\overline{HF}$ bisects $\angle GFJ$ and $\angle GHJ$	① Given
② $\angle 1 \cong \angle 2$; $\angle 3 \cong \angle 4$	② Def'n of Angle Bisector
③ $\overline{FH} \cong \overline{FH}$	③ Reflexive Prop.
④ $\triangle GFH \cong \triangle JFH$	④ ASA
⑤ $\overline{GH} \cong \overline{JH}$	⑤ CPCTC

Ex. 3 Given: $\overline{ST} \cong \overline{TA}$

$\overline{TR} \perp \overline{SA}$

Prove: $\angle STR \cong \angle ATR$

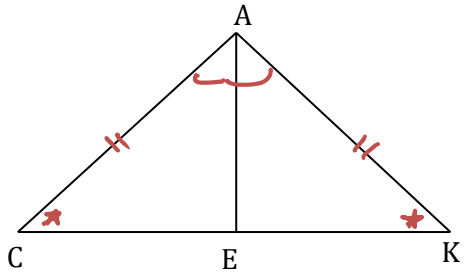


① $\overline{ST} \cong \overline{TA}$	① Given
② $\overline{TR} \perp \overline{SA}$	② Given
③ $\angle SRT, \angle ART$ Right $\angle$s	③ If $\perp$, then Rt $\angle$s
④ $\angle SRT \cong \angle ART$	④ If Rt $\angle$s, then $\cong$.
⑤ $\overline{TR} \cong \overline{TR}$	⑤ Reflexive Prop.
⑥ $\triangle STR \cong \triangle ATR$	⑥ HL
⑦ $\angle STR \cong \angle ATR$	⑦ CPCTC

Ex 4 Given: $\triangle CAK$ is isosceles with base $\overline{CK}$

$\angle CAE \cong \angle KAE$

Prove: E is the midpoint of $\overline{CK}$



① $\triangle CAK$ is isosceles w/ base $\overline{CK}$	① Given
② $\angle CAE \cong \angle KAE$	② Given
③ $\overline{CA} \cong \overline{KA}$	③ If isos. $\triangle$, then sides $\cong$.
④ $\angle C \cong \angle K$	④ If $\triangle$, then $\triangle$
⑤ $\triangle CAE \cong \triangle KAE$	⑤ ASA
⑥ $\overline{CE} \cong \overline{EK}$	⑥ CPCTC
⑦ E is midpt of $\overline{CK}$	⑦ Def. of midpoint