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Triangle Congruence: CPCTC

After today, we should be able to use CPCTC to prove parts of triangles are congruent.

Vocabulary

It is **NOT** used like
SSS, SAS, ASA, AAS, HL.

1. CPCTC

CORRESPONDING PARTS OF CONGRUENT TRIANGLES ARE CONGRUENT

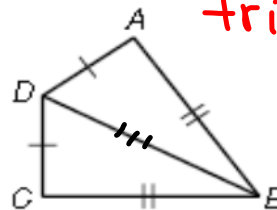
CPCTC is **NOT** a congruence postulate/theorem.

Corresponding Parts of Congruent Triangles are Congruent (CPCTC) is useful in proofs. If you prove that two triangles are congruent, then you can use CPCTC as a justification for proving corresponding parts congruent.

You MUST have congruent triangles first.

Given: $\overline{AD} \cong \overline{CD}$, $\overline{AB} \cong \overline{CB}$

Prove: $\angle A \cong \angle C$



$\overline{BD} \cong \overline{BD}$
SSS

STATEMENTS	REASONS
1. $\overline{AD} \cong \overline{CD}$, $\overline{AB} \cong \overline{CB}$	1. Given.
2. $\overline{DB} \cong \overline{DB}$	2. Reflexive Prop.
3. $\triangle ABD \cong \triangle CBD$	3. SSS
4. $\angle A \cong \angle C$	4. CPCTC

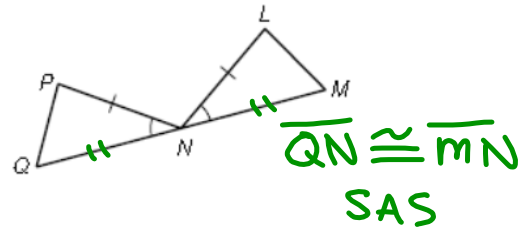
*need $\cong$ Δ s first!

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Complete each proof.

1. Given: $\angle PNQ \cong \angle LNM$, $\overline{PN} \cong \overline{LN}$,
 N is the midpoint of $\overline{QM}$.

Prove: $\overline{PQ} \cong \overline{LM}$



STATEMENTS	REASONS
1. $\angle PNQ \cong \angle LNM$, $\overline{PN} \cong \overline{LN}$, N is the midpoint of $\overline{QM}$.	1. Given
2. $\overline{QN} \cong \overline{MN}$	2. Def. of midpoint
3. $\triangle PQN \cong \triangle LMN$	3. SAS
4. $\overline{PQ} \cong \overline{LM}$	4. CPCTC

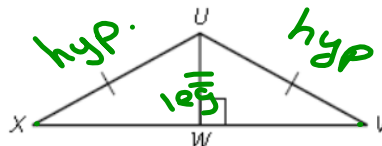
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2. Given: $\triangle UXW$ and $\triangle UVW$ are right $\triangle$ s.

$$\overline{UX} \cong \overline{UV}$$

Prove: $\angle X \cong \angle V$

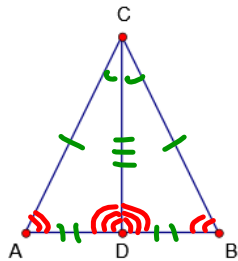
Proof:



Statements	Reasons
1. $\triangle UXW$ and $\triangle UVW$ are rt. $\triangle$ s.	1. Given
2. $\overline{UX} \cong \overline{UV}$	2. a. <u>Given</u>
3. $\overline{UW} \cong \overline{UW}$	3. b. <u>Reflexive Prop.</u>
4. c. <u>$\triangle UXW \cong \triangle UVW$</u>	4. d. <u>HL</u>
5. $\angle X \cong \angle V$	5. e. <u>CPCTC</u>

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Get $\Delta s \cong$ first.



3a) Given $\overline{CA} \cong \overline{CB}$ and $\overline{AD} \cong \overline{BD}$.

Prove $\angle ACD \cong \angle BCD$. CPCTC

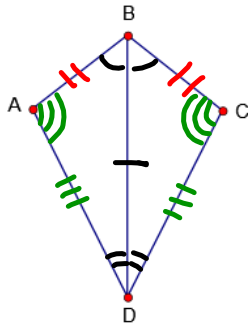
3b) List the other two pairs of congruent, corresponding angles.

$\angle A \cong \angle B$
 $\angle ADC \cong \angle BDC$

Also
Know:
 $\overline{CD} \cong \overline{CD}$.
SSS

STATEMENTS	REASONS
1. $\overline{CA} \cong \overline{CB}, \overline{AD} \cong \overline{BD}$.	1. Given
2. $\overline{CD} \cong \overline{CD}$	2. Reflexive Property.
3. $\Delta ADC \cong \Delta BDC$	3. SSS
4. $\angle ACD \cong \angle BCD$	4. CPCTC

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$$\angle ABD \cong \angle CBD$$

- 4a) Given $\overline{BD}$ bisects $\angle ABC$ and $\overline{DB}$ bisects $\angle ADC$. $\angle ADB \cong \angle CDB$

Prove $\overline{BA} \cong \overline{BC}$. (CPCTC)

we know:
 $\overline{DB} \cong \overline{DB}$

- 4b) Find all the other pairs of congruent, corresponding parts.

$$\begin{aligned} \angle A &\cong \angle C \\ \overline{AD} &\cong \overline{CD} \end{aligned}$$

ASA

STATEMENTS	REASONS
1. $\overline{BD}$ bisects $\angle ABC$, $\overline{DB}$ bisects $\angle ADC$.	1. Given
2. $\angle ABD \cong \angle CBD$ $\angle ADB \cong \angle CDB$	2. Def. of angle bisector
3. $\overline{DB} \cong \overline{DB}$	3. Reflexive Prop.
4. $\triangle ABD \cong \triangle CBD$	4. ASA
5. $\overline{BA} \cong \overline{BC}$	5. CPCTC.