4.6 Use Congruent Triangles

Before You used corresponding parts to prove triangles congruent.

Now You will use congruent triangles to prove corresponding parts congruent.

EQ: How can you use $\cong$ $\triangle$'s to prove sides or $\angle$s are $\cong$?

Corresponding Parts of Congruent Triangles are Congruent (CPCTC)
(related to the definition of congruent figures)

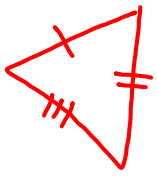
If there are two or more congruent triangles, then
corresponding parts (sides, angles) are congruent.

To show that corresponding parts of congruent triangle are congruent...

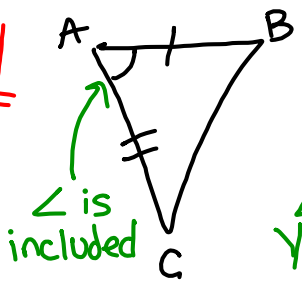
"CPCTC" is "Corresponding Parts of Congruent Triangles are Congruent"

A1. Give the appreviation name for each of the five triangle congruence shortcuts. Include a sketch of the congruence situation.

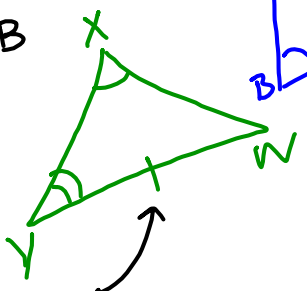
SSS



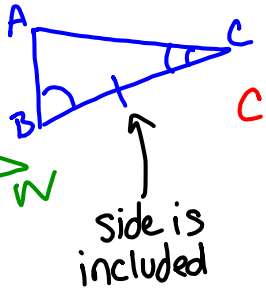
SAS



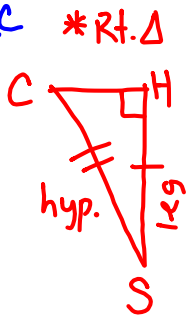
AAS

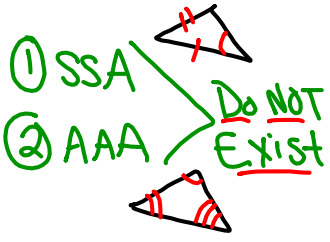


ASA



HL





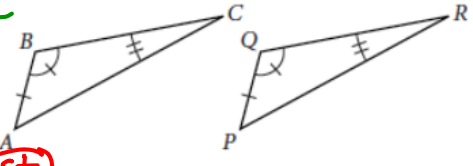
A2. Use the figures at the right to explain why each congruence is true.

a. $\angle A \cong \angle P$ AAS, then CPCTC

b. $\overline{BA} \cong \overline{QP}$ Given in figures

c. $\Delta ABC \cong \Delta PQR$

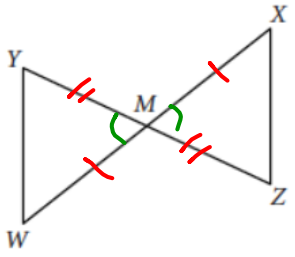
AAS Δ ≅



1st △CBA ≅ △RQP by AAS Δ≅

2nd CPCTC

A3. M is the midpoint of $\overline{WX}$ and $\overline{YZ}$. Is $\overline{WY} \cong \overline{XZ}$? Why?



$\overline{WM} \cong \overline{XM}$
$\overline{YM} \cong \overline{ZM}$ } Def. of mdpt.

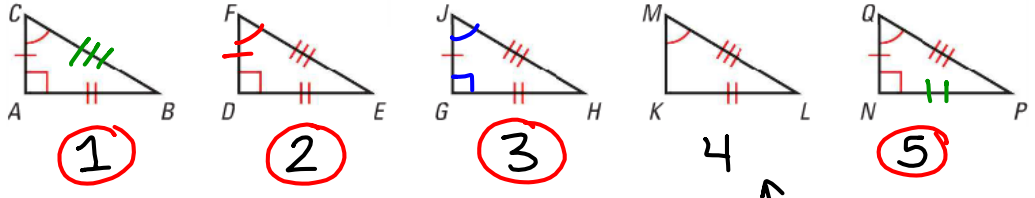
$\angle YMW \cong \angle ZMX$ VA

$\triangle WMY \cong \triangle XMZ$ SAS

$\overline{WY} \cong \overline{XZ}$ CPCTC

* Your Reasons may vary

A4. Circle the triangles below that are congruent.



1 2 3 4 5

$\triangle 1 \cong \triangle 5$ ASA
→ Now mark CPCTC

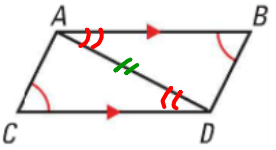
$\triangle 1 \cong \triangle 3$ SSS
→ Now mark CPCTC

$\therefore \triangle 5 \cong \triangle 3$

$\triangle 2 \cong \triangle 1, 3, 5$ HL Thm.
→ mark CPCTC

4 ↑ NOT $\cong$ because SSA Does NOT Exist

A5. Make a plan to prove the statement... $\overline{AC} \cong \overline{DB}$



since $\overline{AB} \parallel \overline{CD}$

$\angle BAD \cong \angle CDA$ by AIA

$\overline{AD} \cong \overline{DA}$ Reflexive

$\triangle ADC \cong \triangle DAB$ by AAS $\triangle \cong$

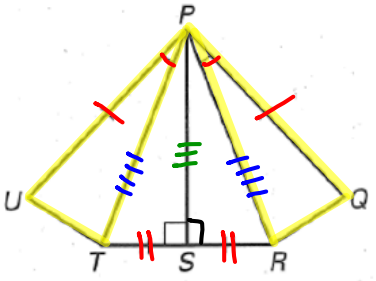
$\therefore$ $\overline{AC} \cong \overline{DB}$ CPCTC

A6. What does "CPCTC" stand for?

"CPCTC" is "Corresponding
Parts of
Congruent
Triangles are
Congruent

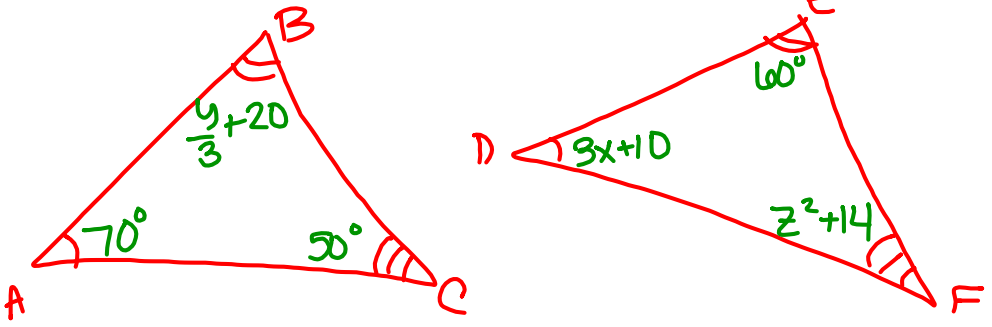
A7. **GIVEN:** $\overline{RS} \cong \overline{ST}$, $\overline{PU} \cong \overline{PQ}$, $\angle UPT \cong \angle QPR$

PROVE: $\Delta PTU \cong \Delta PRQ$



Statement	Reason
1) $\overline{RS} \cong \overline{ST}$	1) Given
2) $\overline{PU} \cong \overline{PQ}$	2) Given
3) $\angle UPT \cong \angle QPR$	3) Given
4) $\angle PSR$ is a rt $\angle$	4) Def of $\perp$
5) $\overline{PS} \cong \overline{PS}$	5) Reflexive
6) $\Delta PST \cong \Delta PSR$	6) SAS
7) $\overline{PT} \cong \overline{PR}$	7) CPCTC
8) $\Delta UPT \cong \Delta QPR$	8) SAS

A8. Given that $\Delta ABC \cong \Delta DEF$, $m\angle A = 70°$, $m\angle B = \left(\frac{y}{3} + 20\right)°$, $m\angle C = 50°$, $m\angle D = (3x + 10)°$, $m\angle E = 60°$, and $m\angle F = (z^2 + 14)°$, find the values of x, y, and z.



$3x + 10 = 70$
$-10 \quad -10$
$3x = 60$
$x = 20$

$\frac{y}{3} + 20 = 60$
$-20 \quad -20$
$3\left(\frac{y}{3}\right) = (40)3$
$y = 120$

$z^2 + 14 = 50$
$-14 \quad -14$
$z^2 = 36$
$\sqrt{z^2} = \sqrt{36}$
$z = 6$

4.6 Summary:

Given $\cong$ $\triangle$s then the corresponding parts are $\cong$.

* CPCTC *

Ex: Given $\triangle ABC \cong \triangle JLH$

then,

$\angle A \cong \angle J$ $\quad \overline{AB} \cong \overline{JL}$

$\angle B \cong \angle L$ $\quad \overline{BC} \cong \overline{LH}$

$\angle C \cong \angle H$ $\quad \overline{AC} \cong \overline{JH}$