Triangle Congruence

- **I Have CPCTC**
  by Karadimos, MD
-

I woke up this morning not feeling like I should.
The doctor told me it's not good.

Something has happened to me.
I came down with CPCTC.

Doc said, "When your triangles became identical,
your corresponding parts measured equal."

I said, "When corresponding parts were the same,
congruent figures were to blame."

The bad news is,
CPCTC is very contagious.
The good news is,
you can use it to be courageous.

Solving proofs can be tough.
SSS, SAS, ASA, AAS isn't always enough.

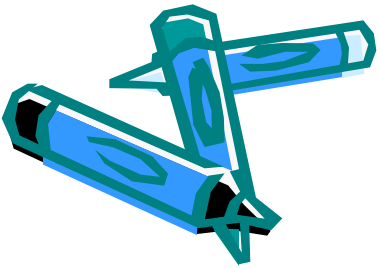
CPCTC is the next device.
You'll hear Karadimos, MD give that advice.

The test for CPCTC,
is to examine the geometry.

Congruent triangles is the start.
CPCTC is the very next part.

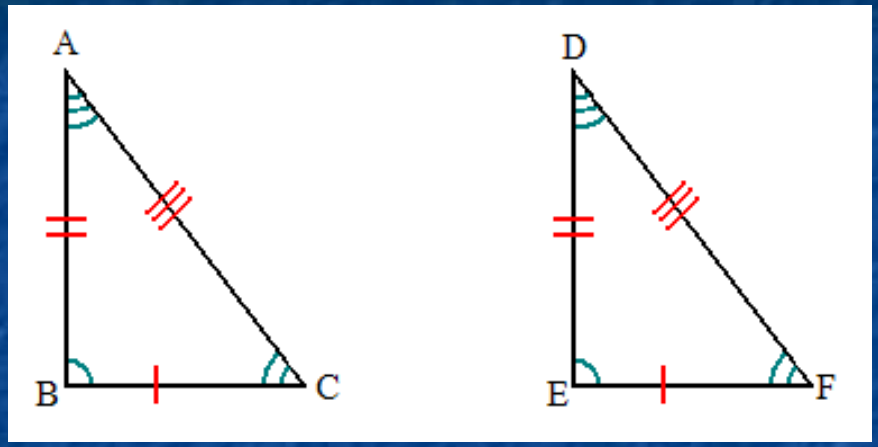
To find the cure for the CPCTC blues,
wait for non-congruent triangles to hit the news.

Doctors have no pills,
for my CPCTC ills.



Triangle Congruence Theorem

In geometry, **CPCTC** is the abbreviation of a theorem involving congruent triangles. *CPCTC stands for **C**orresponding **P**arts of **C**ongruent **T**riangles are **C**ongruent.* CPCTC states that if two or more triangles are congruent, then all of their corresponding parts are congruent as well.



If $\Delta ABC \cong \Delta DEF$ then,

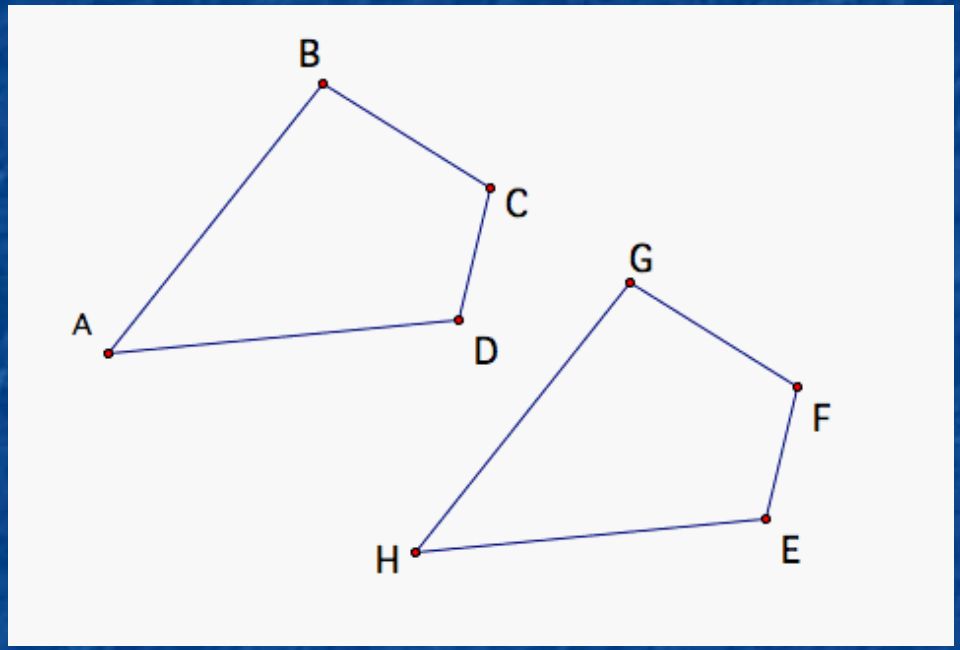
$$\overline{AB} \cong \overline{DE}, \overline{BC} \cong \overline{EF}, \overline{AC} \cong \overline{DF}$$

$$\angle A \cong \angle D, \angle B \cong \angle E, \angle C \cong \angle F$$

Generalization for CPCTC

- CPCFC means when any 2 figures are congruent, then corresponding parts are also

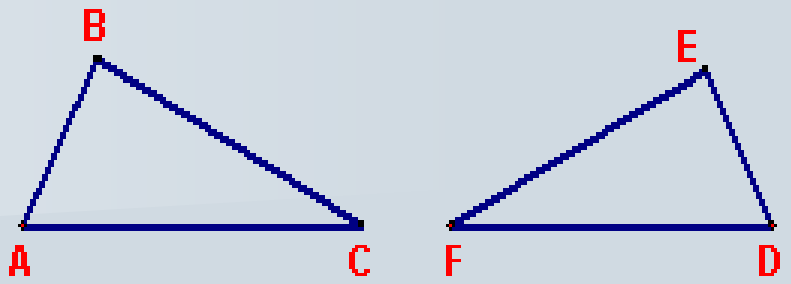
Corresponding Parts of Congruent Figures are Congruent.



Notes: Example proofs

Given : $\overline{AB} \cong \overline{DE}; \angle B \cong \angle E, \overline{BC} \cong \overline{EF}$

Prove : $\overline{CA} \cong \overline{FD}$



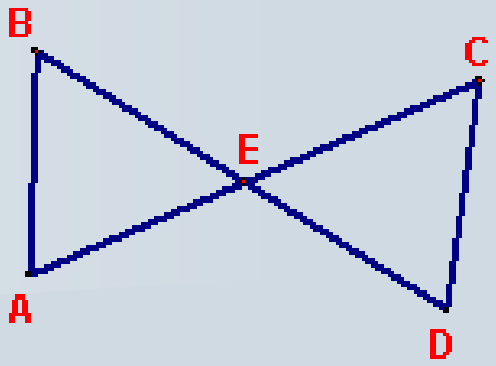
Statements	*Reasons*
1. $\overline{AB} \cong \overline{DE}$ (S)	1. Given
2. $\angle B \cong \angle E$ (A)	2. Given
3. $\overline{BC} \cong \overline{EF}$ (S)	3. Given
4. $\Delta ABC \cong \Delta DEF$	4. *S*AS congruence theorem
5. $\overline{CA} \cong \overline{FD}$	5. CPCTC

Another Example proof

Given: E is the midpoint of $\overline{BD}$

$\overline{BD}$ bisects $\overline{AC}$

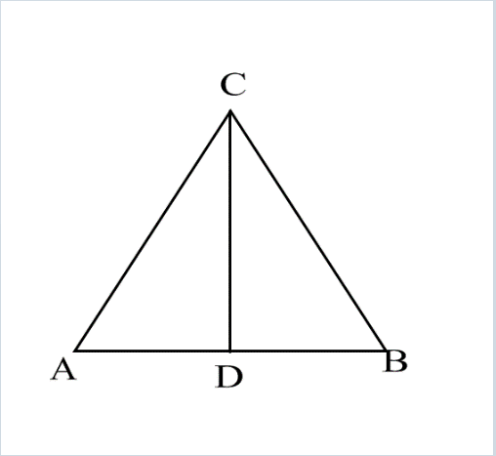
Prove: $\angle B \cong \angle D$



Statements	Reasons
1. E is the midpoint of BD $\overline{BD}$ bisects $\overline{AC}$	1. Given
2. $\overline{BE} \cong \overline{DE}$ (S)	2. A midpoint divides a segment into 2 congruent segments.
3. $\angle BEA \cong \angle DEC$ (A)	3. Vertical angles are congruent.
4. $\overline{AE} \cong \overline{CE}$ (S)	4. A segment bisector divides a segment into 2 congruent segments.
5. $\Delta BEA \cong \Delta DEC$	5. SAS congruence theorem
6. $\angle B \cong \angle D$	6. CPCTC

Example proof #3:

Given: $\overline{CD}$ is an angle bisector of $\angle ACB$ $\overline{CA} \cong \overline{CB}$
Prove: $\overline{AD} \cong \overline{BD}$

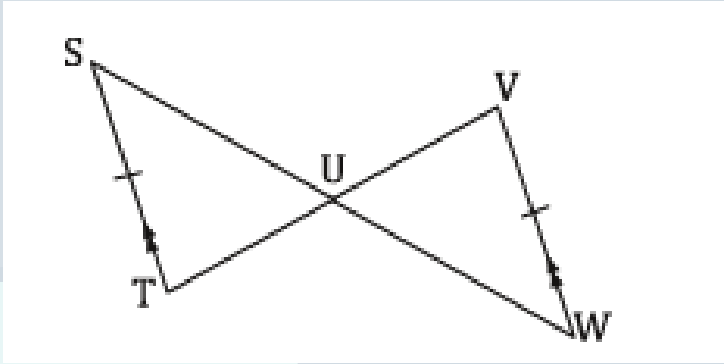


Statements	Reasons
1) $\overline{CD}$ is an angle bisector of $\angle ACB$	1) Given
$\overline{CA} \cong \overline{CB}$	
2) $\angle ACD \cong \angle BCD$	2) An angle bisector divides an angle into 2 congruent angles.
3) $\overline{CD} \cong \overline{CD}$	3) Reflexive property
4) $\Delta ACD \cong \Delta BCD$	4) SAS congruence theorem
5) $\overline{AD} \cong \overline{BD}$	5) CPCTC

Try Another Proof:

Given: $\overline{ST} \| \overline{WV}$, and $\overline{ST} \cong \overline{VW}$

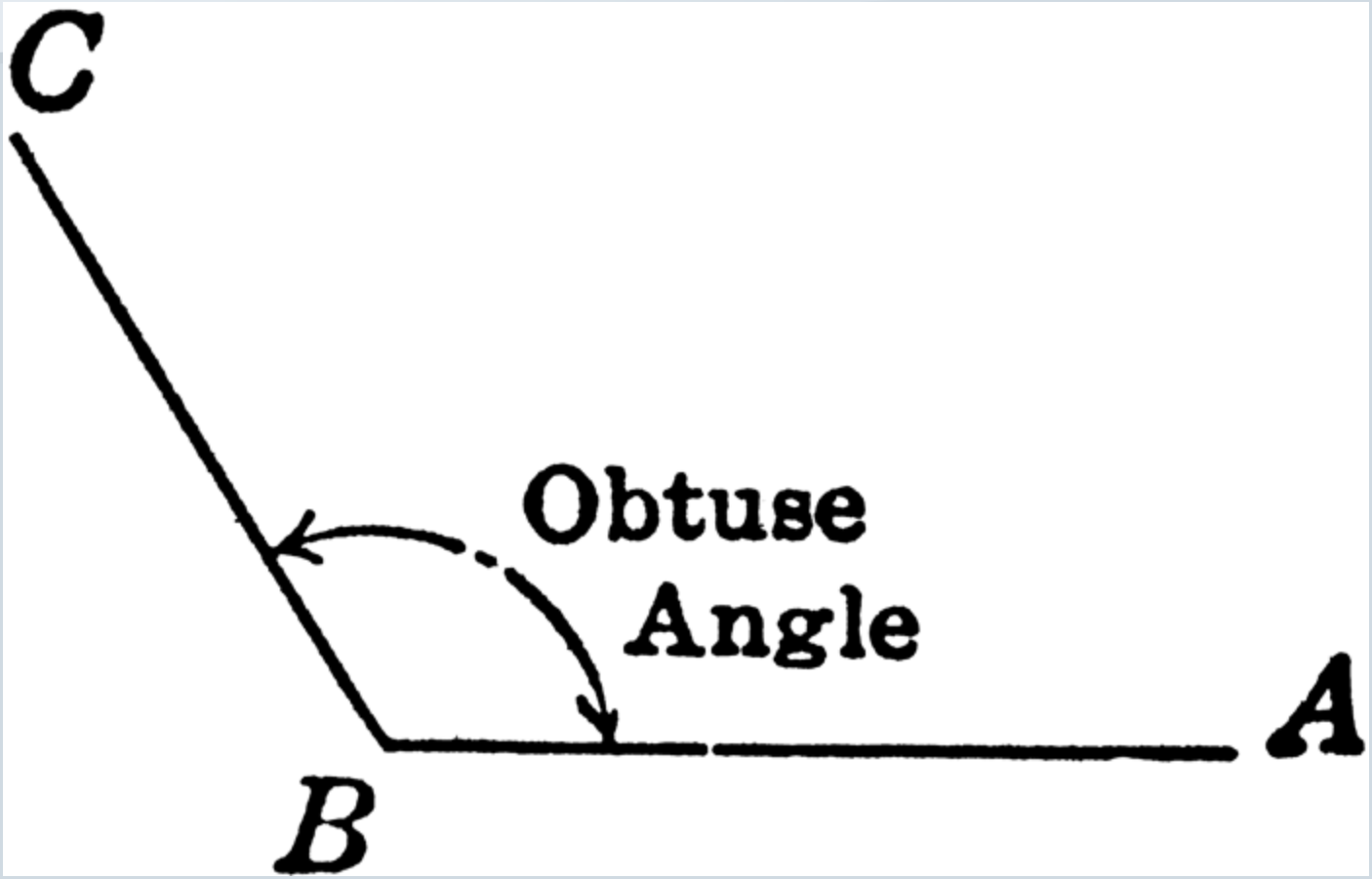
$\text{Prove}: \overline{SU} \cong \overline{WU}$



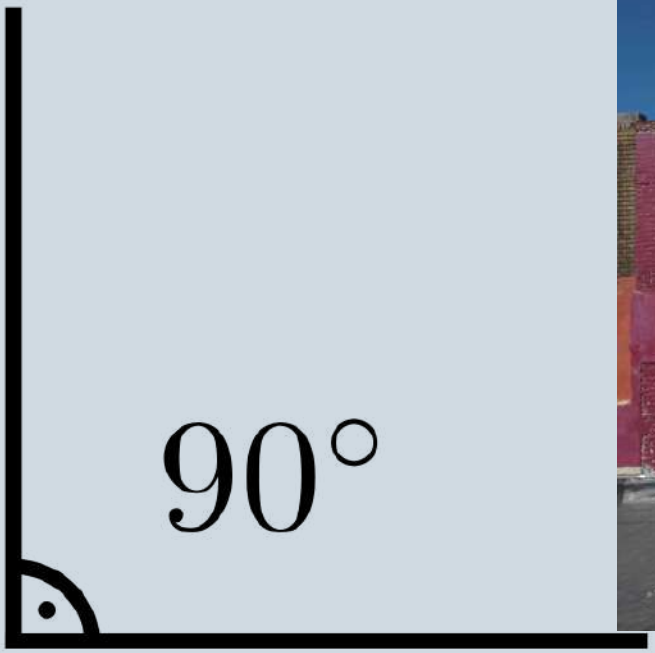
Statements	Reasons
1) $\overline{ST} \| \overline{WV}$, and $\overline{ST} \cong \overline{VW}$	1) Given
2) $\angle STU \cong \angle WVU$	2) If 2 parallel lines are cut by a transversal, then alternate interior angles are congruent.
3) $\angle TSU \cong \angle VWU$	3) If 2 parallel lines are cut by a transversal, then alternate interior angles are congruent.
4)	4)
5) $\Delta STU \cong \Delta WVU$	5) ASA congruence theorem **AAS congruence theorem**
6) $\overline{SU} \cong \overline{WU}$	6) CPCTC

OR you can use vertical angles are congruent (angle SUT is congruent to angle WUV)

Why was the obtuse angle upset?



Because he was never right!!!!



What do you get when you cross geometry with McDonalds?

A plane cheeseburger!


6/27
HA! YOU WOULDN'T KNOW AN ISOSCELES IF IT BIT YOU IN THE HYPOTENUSE! REALLY, FRANK - SOMETIMES YOU'RE SO OBTUSE.
AND YOU'RE ALWAYS RIGHT, VIVIAN.
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Don't practice until you get it right. Practice until you can't get it wrong.

- Unknown