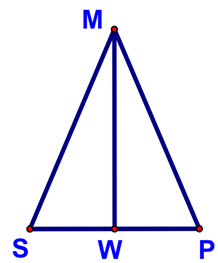



## CPCTC and Circles - Lesson 3-3

Here's the warmup!

**Given:** $\overline{SM} \cong \overline{PM}$
$\angle SMW \cong \angle PMW$

**Prove:** $\overline{SW} \cong \overline{WP}$

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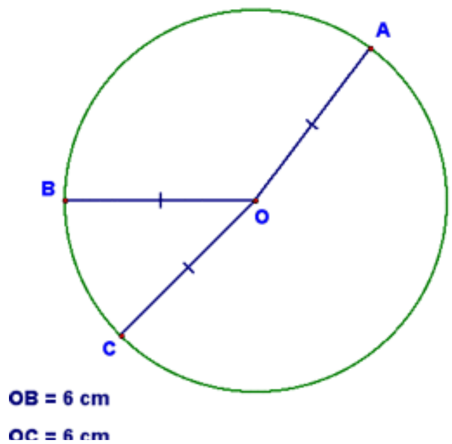
Note that to do the last step of this proof, you need to consider the definition of congruent triangles and coming up with an acronym for it:

***Congruent Triangles*** **- If two triangles are congruent, then the corresponding parts of those congruent triangles are congruent.**

**a.k.a.....CPCTC!!**

We also need to define a few things related to circles and note a new theorem:




**A *circle* is the set of all points in a plane at a given distance from a given point in the plane.**

**The given point is the *center of the circle*. You name a circle by its center (e.g., ⊙*O*).**

**The given distance is called the *radius of the circle* (e.g., *OA* is the radius of ⊙*O*). A segment from a point of the circle to the center is also called a radius (e.g., $\overline{OA}$ is a radius).**

***Theorem 19*** **- All radii of a given circle are congruent.**

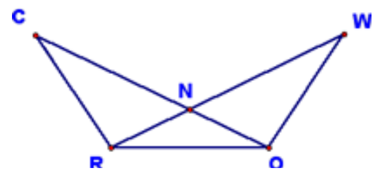
Now, let's use this, in combination with some of our congruence shortcuts to prove some things! Don't be intimidated by this stuff...it's really not that hard...and you can all do it!

We'll start with the following example:

$\overline{CN} \cong \overline{WN}$
$\angle C \cong \angle W$

Is $\overline{RN} \cong \overline{ON}$ ?

Why?

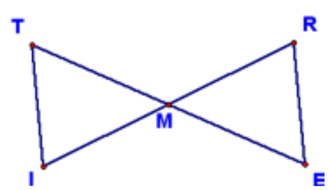



And then this one:

$\angle E \cong \angle T$
M is the midpoint of $\overline{TE}$

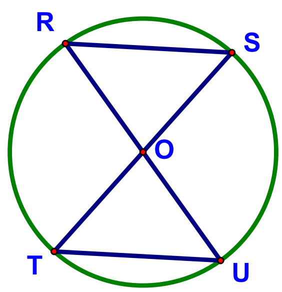
Is $\overline{MI} \cong \overline{MR}$ ?

Why?



Next, let's look at a couple of proofs. Here are two examples using this stuff (note how key the given circle is...it helps to know that the radii from the center are congruent! Without the fact that the circle is given, the proofs wouldn't be possible!):

**Given:** $\odot O$




**Prove:** $\overline{RS} \cong \overline{UT}$

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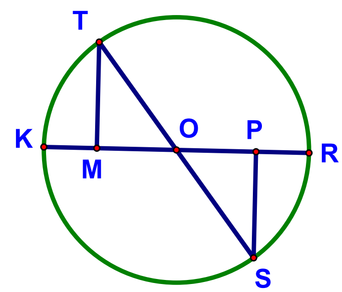
**Given:** ⊙O
∠T is comp. to ∠MOT
∠S is comp. to ∠POS

**Prove:** $\overline{MO} \cong \overline{PO}$

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