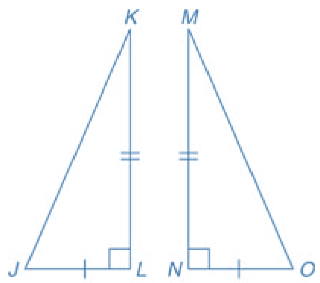
Congruent Right Triangles

Right triangles are special triangles that contain one right angle. With right triangles, we name the sides of the triangle. The two sides that include the right angle are called *legs* and the side opposite the right angle is called the *hypotenuse*.

To prove congruent right triangles we have special theorems established from the three main postulates.

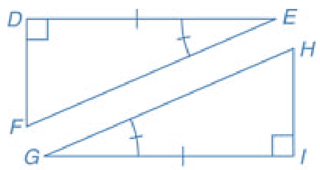
The Leg-Leg Theorem is actually the Side-Angle-Side Postulate.

Theorem 1: **Leg-Leg Theorem:** if the legs of one right triangle are congruent to the legs of another right triangle, then the two right triangles are congruent.



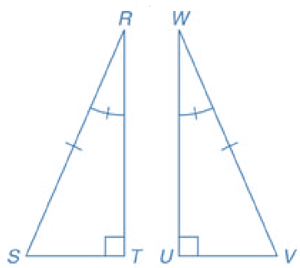
The Leg-Acute Angle Theorem is actually the Angle-Side-Angle Postulate.

Theorem 2: **Leg-Acute Angle Theorem:** if a leg and an acute angle of one right triangle are congruent to the corresponding parts of another right triangle, then the two right triangles are congruent.



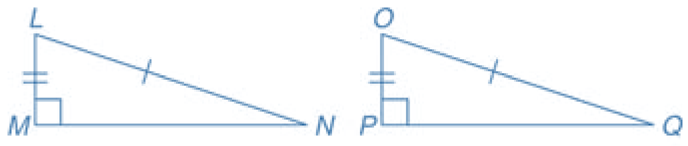
The Hypotenuse-Acute Angle Theorem is actually the Angle-Angle-Side Postulate.

Theorem 3: **Hypotenuse-Acute Angle Theorem:** if the hypotenuse and an acute angle of a right triangle are congruent to the hypotenuse and an acute angle of another right triangle, then the two triangles are congruent.



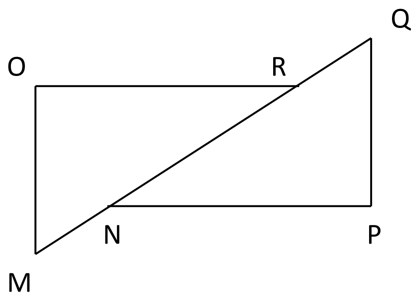
The Hypotenuse-Leg Postulate is a rule that you can use with right triangles only. This rule is considered a postulate because it is not based on any other rules.

Postulate: **Hypotenuse-Leg Postulate:** if the hypotenuse and a leg of one right triangle are congruent to the hypotenuse and a leg of another right triangle, then the triangles are congruent.



Example 1: Given: $m\angle O = m\angle P = 90°$, $\overline{MN} \cong \overline{QR}$, $\overline{OM} \cong \overline{PQ}$

Prove: $\Delta MOR \cong \Delta QPN$



Statements	Reasons
In ΔMOR and ΔQPN, we have:	
$m\angle O = m\angle P = 90°$	Given
ΔMOR and ΔQPN are right triangles	Definition of right triangles
$\overline{MN} \cong \overline{QR}$	Given
$MR = MN + NR$ $QN = QR + RN$	Segment Addition Postulate
$\Rightarrow MR = QN$	Substitution
$\overline{MN} \cong \overline{QR}$	Segments with equal measure are congruent
$\Delta MOR \cong \Delta QPN$	HL Theorem