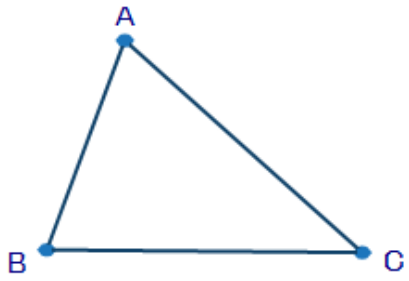
2.04 Triangle Proofs

Types of Triangles Video CLICK HERE

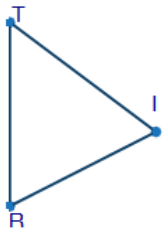
Equilateral	Draw Examples
a triangle that has _____ congruent sides. They also have all _____ angles, each measuring _____ each.	
Scalene	
a triangle that has _____ congruent sides. Scalene triangles also have _____ congruent angles.	
Isosceles	
a triangle with at least _____ congruent sides. The _____ corresponding angles will also be congruent.	
Acute	
a triangle with all three angles are acute (_____ than 90°).	
Right	
a triangle that contains an angle measure of _____ degrees.	
Obtuse	
a triangle with one obtuse angle (_____ than 90°) and two acute angles.	
Equiangular	
a triangle where all three angles measure ____°.	

Triangle Sum Theorem Video CLICK HERE

Triangle Sum Theorem - The _____ of the measures of the angles in a triangle is _____°. m∠A + m∠B + m∠C = _____°	

Triangle Sum Theorem Proof Video **CLICK HERE**

Prove the sum of the angles in ΔTRI, shown below, total 180°.



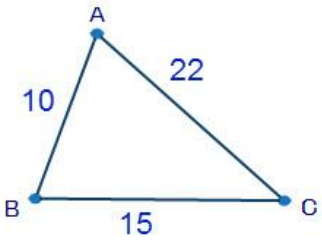
Two-column Proof:

Statement	**Reason**
Draw AN parallel to TR	by Construction
m∠AIT + m∠RIT + m∠RIN = m∠_____	_____ Addition Postulate
∠AIT ≅ ∠_____	Alternate _____ Angles
∠RIN ≅ ∠_____	Alternate _____ Angles
m∠ITR + m∠RIT + m∠TRI = m∠AIN	_____
∠AIN = _____°	Definition of a _____ Angle
m∠ITR + m∠RIT + m∠TRI = _____°	Substitution

Triangle Inequality Theorem Video **CLICK HERE**

The sum of any two sides of a triangle is always _____ than the length of the third side.

Example:



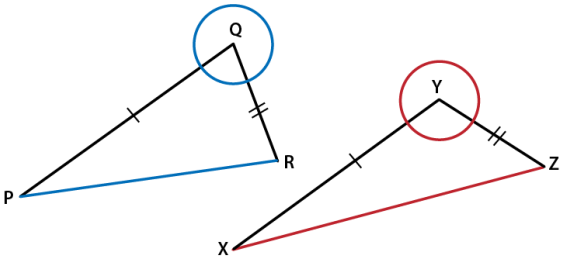
AB + BC > _____

BC + AC > _____

AC + AB > _____

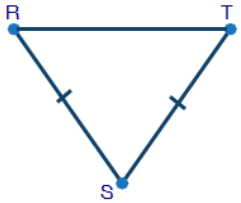
Hinge Theorem Video **CLICK HERE**

If two triangles have two congruent corresponding sides, and the included angle of the first triangle is _____ than the included angle of the second triangle, then the third, opposite side of the first triangle will be _____ than the third, opposite side of the second triangle.



Isosceles Triangle Theorem Proof Video **CLICK HERE**

In ΔRST, shown below, RS ≅ ST. Prove that ∡TRS ≅ ∡STR.



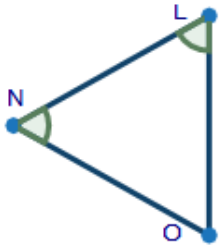
Paragraph Proof Video:

RS ≅ ST according to the _____ information. Using a compass and straightedge, construct _____ as an angle bisector of ∡RST. ∡RSU is congruent to _____ by the definition of an angle bisector. $\overline{US}$ is congruent to $\overline{US}$ by the _____ Property of Equality. ΔRSU is congruent to△ TSU by the _____ Postulate. Therefore, ∡TRS ≅ ∡STR by CPCTC (___orresponding ___arts of ___ongruent ___riangles are ___ongruent).

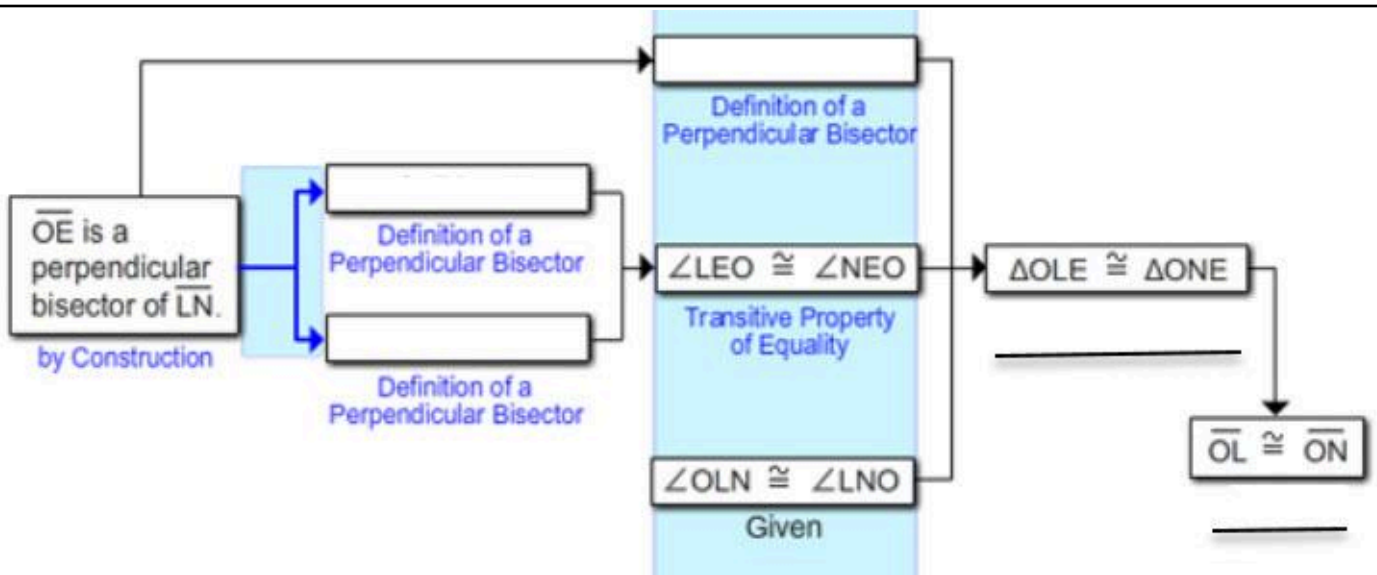
Converse of the Isosceles Triangle Theorem Proof Video **CLICK HERE**

Given: In ΔOLN, ∠OLN ≅ ∠LNO

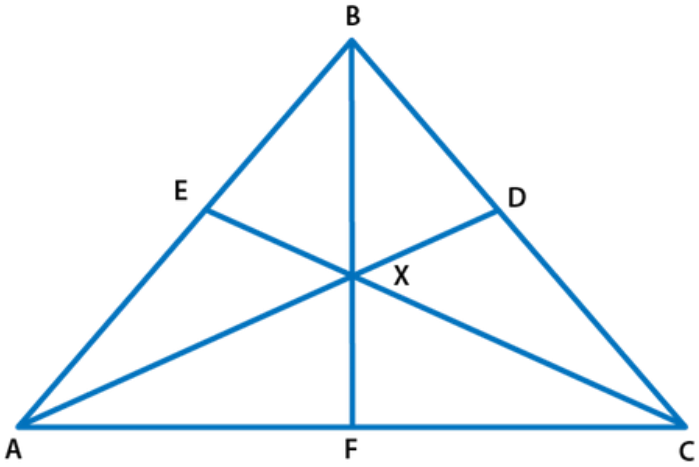
Prove: $\overline{OL} \cong \overline{ON}$



Flowchart Proof:

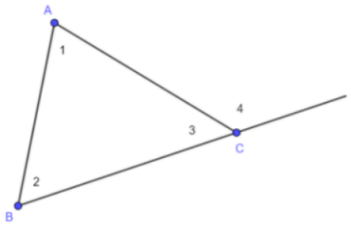


Let's Practice!

Question 1 Video CLICK HERE	**Question 2** Video CLICK HERE
ABC is an Equilateral triangle with Angle Bisectors BF, AD, and CE.  If m∠BCA = 60°, what is m∠CXA?	Charlie is building a shelf shaped like a triangle. He has 3 pieces of wood with lengths of 12 inches, 20 inches, and 7 inches. Will he be able to create a triangular shelf without cutting any of the pieces of wood?

Question 3 Video CLICK HERE

Given: △ ABC
Prove: m ∠ 1 + m ∠2 = m ∠ 4



		∠ 3 and ∠ 4 form a linear pair and are supplementary
Given		
		m ∠ 3+ m ∠ 4 = 180
Triangle Sum Theorem		Definition of Supplementary
m ∠ 1+ m ∠ 2 + m ∠ 3 = m ∠ 3+ m ∠ 4		
m ∠ 1+ m ∠ 2 = m ∠ 4		
Subtraction Property of Equality		

The _____ _____ of a triangle is equal to the sum of its two _____ _____ angles.

Question 4 Video [CLICK HERE]	
Given: m ∠ 2 = 28° and m ∠ 3 = 61° Prove: m ∠ 4 + m ∠ 5 + m ∠ 6 = 360° **The _____ of the _____ _____** **in a triangle is _____.**