

Honors Geometry**Ch 4 Notes Packet****Sec 4-1:**

After this section you will be improving your skills in the following Mathematical Practice(s):

- 2. Reason abstractly and quantitatively**
- 6. Attend to precision**

Specifically, you should be able to:

- **Identify and classify triangles by angle measures and by side measures**

Acute

Equiangular

Equilateral

Isosceles

Obtuse

Right

Scalene

Sec 4-2:

After this section you will have completed the following Common Core State Standard(s):

- **G.CO.10: Prove theorems about triangles**

And will be improving your skills in the following Mathematical Practice(s):

- 1. Make sense of problems and persevere in solving them**
- 3. Construct viable arguments and critique the reasoning of others**

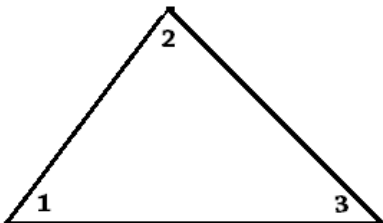
Specifically, you should be able to:

- **Apply the triangle sum theorem**
- **Apply the exterior angle theorem**

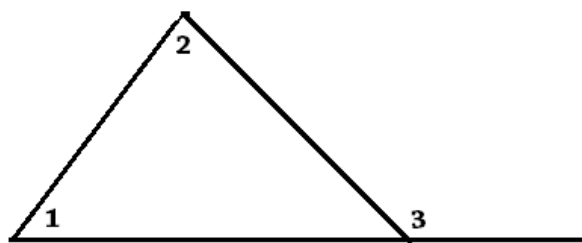
The Triangle Sum Theorem: The sum of the measures of the _____ angles of a triangle is _____.

Given: ABC is a triangle

Prove: $m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$



Exterior Angle Theorem: The measure of an exterior angle of a triangle is equal to _____



Flow Proof:

Corollary: A statement that _____.

- The acute angle of a right triangle are _____.
- There can be at most one _____ in a triangle.

Examples:

Sec 4-3:

After this section you will have completed the following Common Core State Standard(s):

- **G.CO.7: Use the definition of congruence in terms of rigid motions to show that 2 triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent**
- **G.SRT.5: Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures**

And will be improving your skills in the following Mathematical Practice(s):

- 3. Construct viable arguments and critique the reasoning of others**
- 6. Attend to precision**

Specifically, you should be able to:

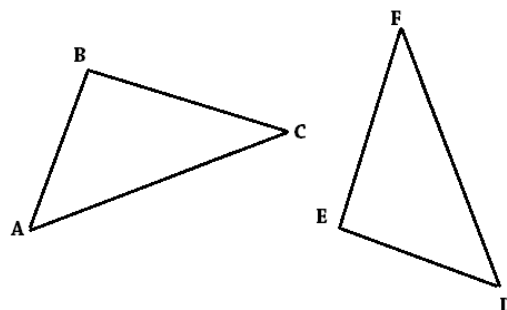
- **Name and use corresponding parts of congruent polygons**
- **Prove triangle congruent using the definition of congruence**

Definition of Congruent Polygons: Two polygons are

_____ if and only if all of their _____ sides and angles are _____.

If

then



CPCTC (C_____ P_____ of C_____ T_____ are C_____.)

This means that if two triangles are _____, then all of their other corresponding sides and angles must also be _____.

Third Angles Theorem:

If two angles of one triangle are congruent to two angles of another triangle, then the third angles are _____.

Reflexive Property of Congruence:

Symmetric Property of Congruence:

Transitive Property of Congruence:

Examples:

Sec 4-4 & 4-5:

After this section you will have completed the following Common Core State Standard(s):

- **G.CO.10: Prove theorems about triangles**
- **G.SRT.5: Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures**

And will be improving your skills in the following Mathematical Practice(s):

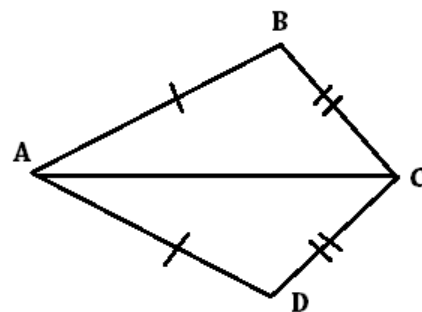
- 1. Make sense of problems and persevere in solving them**
- 3. Construct viable arguments and critique the reasoning of others**
- 5. Use appropriate tools strategically**

Specifically, you should be able to:

- **Use the SSS, SAS and ASA postulate and the AAS theorem to test for congruence**

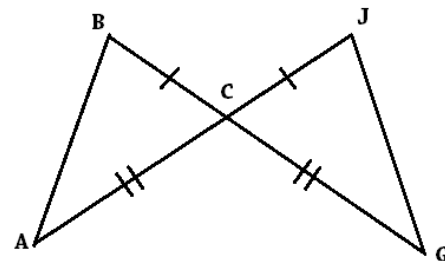
Side-Side-Side () Congruence Postulate:

If _____ of one triangle are congruent to _____ of another triangle, then the triangles are _____.



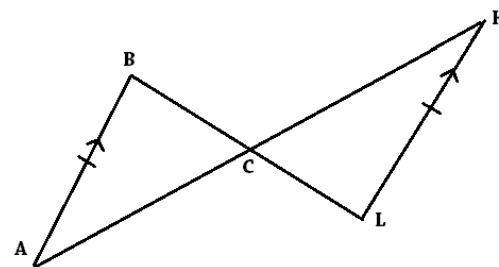
Side-Angle-Side () Congruence Postulate:

If _____ of one triangle are congruent to those of another triangle, then the triangles are _____.



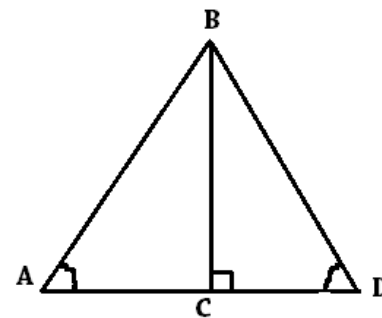
Angle-Side-Angle () Congruence Postulate:

If _____ of one triangle are congruent to those of another triangle, then the triangles are _____.



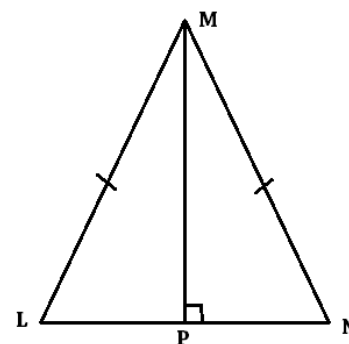
Angle-Angle-Side () Congruence Theorem:

If _____ of one triangle are congruent to those of another triangle, then the triangles are _____.



Hypotenuse-Leg () Congruence Theorem

If the _____ of a _____ triangle are congruent to those of another _____ triangle, then the triangles are _____.



Combinations that work: SSS, SAS, ASA, AAS, HL

Combinations that don't work: AAA, SSA

Examples:

Sec 4-6:

After this section you will have completed the following Common Core State Standard(s):

- **G.CO.10: Prove theorems about triangles**

And will be improving your skills in the following Mathematical Practice(s):

2. Reason abstractly and quantitatively

3. Construct viable arguments and critique the reasoning of others

Specifically, you should be able to:

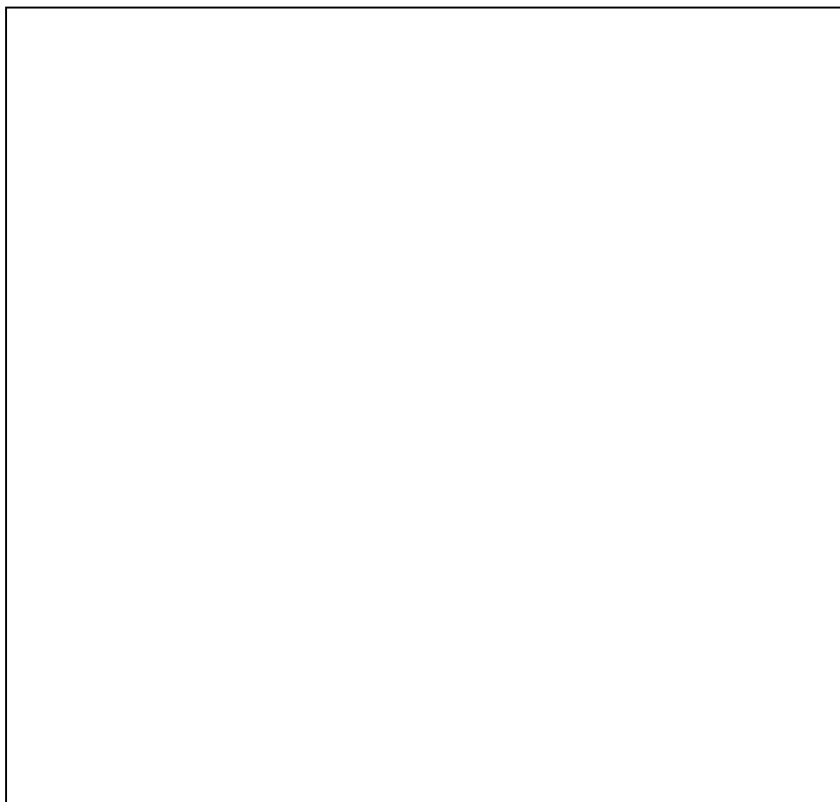
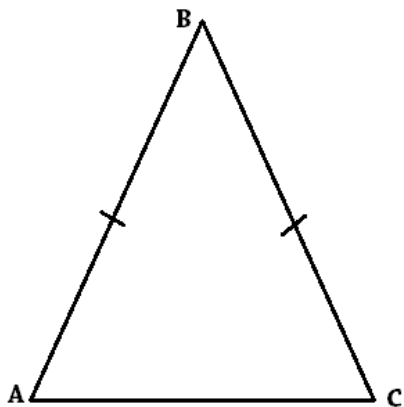
- Use the properties of isosceles triangles
- Use properties of equilateral triangles

Isosceles Triangle Theorem + Converse: Two sides of a triangle are congruent if and only if _____.

Proof:

given: $\overline{AB} \cong \overline{BC}$

prove: $\angle A \cong \angle C$



Equilateral Triangle Corollaries:

- A triangle is equilateral if and only if _____
- Each angle of an equilateral triangle measures _____

Examples:

Sec 4-7:

After this section you will have completed the following Common Core State Standard(s):

- **G.CO.6: Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; and given 2 figures, use the definition of congruence in terms of rigid motion to decide if they are congruent.**
- **G.CO.7: Use the definition of congruence in terms of rigid motions to show that 2 triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent**

And will be improving your skills in the following Mathematical Practice(s):

- 1. Makes sense of problems and persevere in solving them**
- 7. Look for and make use of structure**

Specifically, you should be able to:

- **Identify reflections, translations and rotations**
- **Verify congruence after a congruence transformation**

Congruent (rigid) transformations (isometries) are transformations that

_____.

Image:

Preimage:

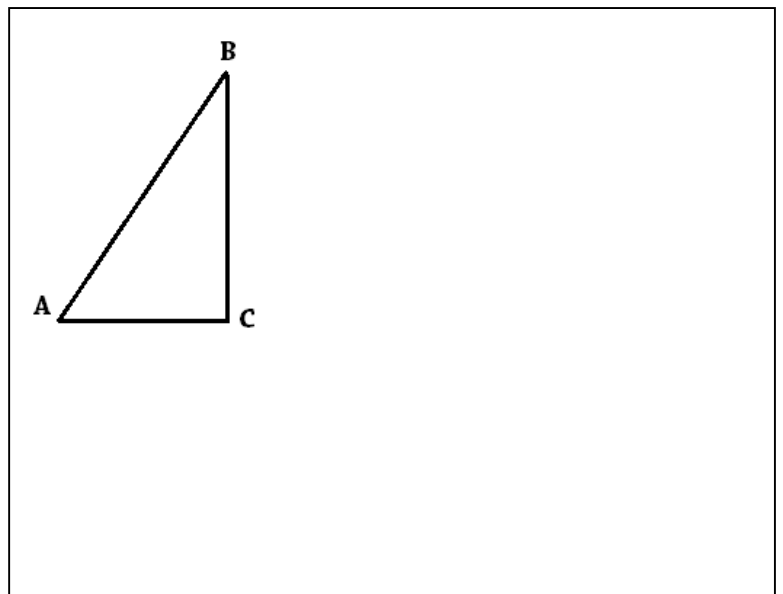
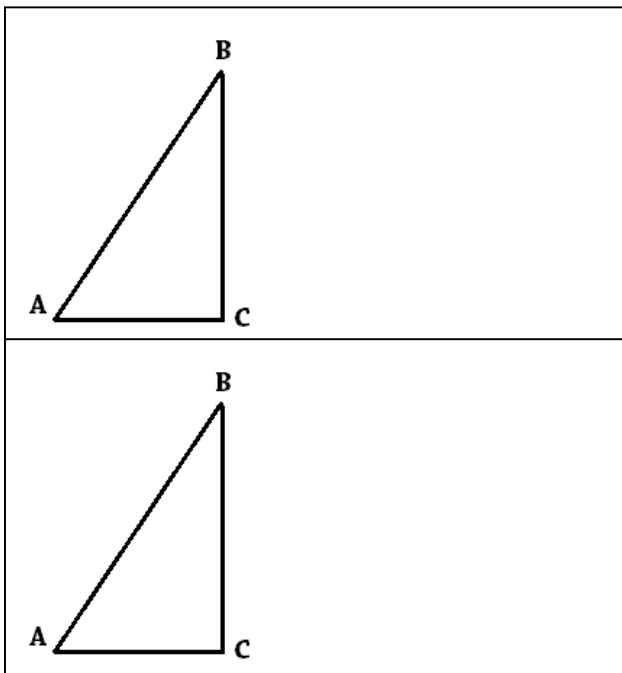
Translation: Every point in a figure moves _____

_____.

Rotation: Every point moves _____

_____.

Reflection: Every point is moved _____ (the line of reflection or mirror) and stays _____ that it was before.



Examples:

Sec 4-8:

After this section you will have completed the following Common Core State Standard(s):

- **G.CO.10: Prove theorems about triangles**
- **G.GPE.4: Use coordinates to prove simple geometric theorems algebraically**

And will be improving your skills in the following Mathematical Practice(s):

- 2. Reason abstractly and quantitatively**
- 3. Construct viable arguments and critique the reasoning of others**

Specifically, you should be able to:

- **Position and label triangles for use in coordinate proofs**
- **Write coordinate proofs**

Coordinate Proofs

When you do a coordinate proof with specific points it only proves something is true for _____ shape, but if you use variables for points, then it proves that it's true for _____ of those shapes.

Examples:

Prove the segment connecting the midpoints of two sides of a triangle is parallel to and half the length of the third side.

Prove the segment that joins the vertex of the right angle in a right triangle to the midpoint of the hypotenuse is perpendicular to the hypotenuse.