

You Can Do It !

Congruence Theorems, Δ 's

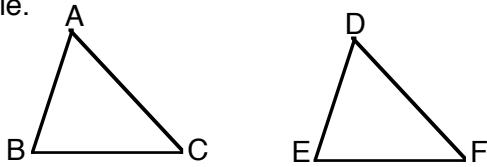
by Bill Hanlon

In math, the word *congruent* is used to describe objects that have the same size and shape. When you traced things when you were a little kid, you were using congruence. Neat, don't you think?

Stop signs would be examples of congruent shapes. Since a stop sign has 8 sides, they would be congruent octagons.

We are going to look specifically at triangles. To determine if two triangles are congruent, they must have the same size and shape. They must fit on top of each other, they must coincide.

Mathematically, we say all the sides and angles of one triangle must be congruent to the corresponding sides and angles of other triangle.



In other words, we would have to show angles A, B, and C were congruent (\cong) to angles D, E and F, then show AB, BC, and AC were \cong to DE, EF, and DF respectively.

We would have to show those six relationships.

Ah, but there is good news. If I gave everyone reading this column three sticks of length 10", 8", and 7", then asked you to glue the ends together to make triangles, something interesting happens. When I collect the triangles, they all fit very nicely on top of each other, they coincide. They are congruent !

Why's that good news? Because rather than showing all the angles and all the sides of one triangle are congruent to all the sides and all the angles of another triangle (6 relationships), I was able to determine congruence just using the 3 sides. A shortcut.

That leads us to the side, side, side congruence postulate.

SSS Postulate

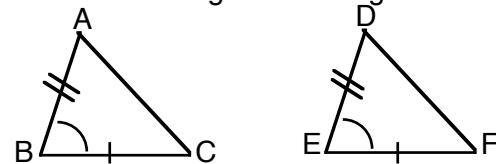
If three sides of one triangle are congruent, respectively, to three sides of another triangle, then the triangles are congruent.



Using the same type of demonstration as before, we can come up with two more congruence postulates.

The side, angle, side postulate is abbreviated **SAS Postulate**.

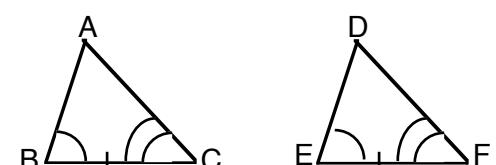
If two sides and the included angle of one triangle are congruent to two sides and the included angle of another triangle, respectively, then the two triangles are congruent.



A third postulate is the angle, side, angle postulate.

ASA Postulate

If two angles and the included side of one triangle are congruent to the corresponding parts of another triangle, the triangles are congruent.



If you are going to be successful, you need to memorize those three postulates and be able to visualize that information.

Combining this information with previous information, we will be able to determine if triangles are congruent. So study and review!