

CUT & GLUE SORT

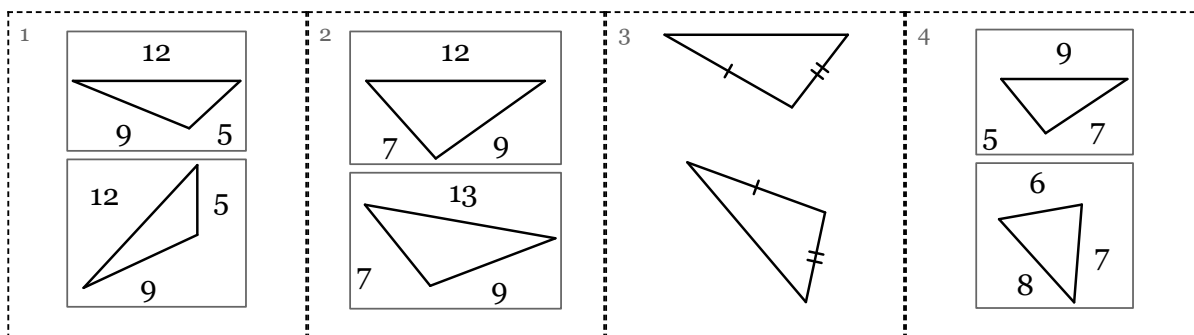


THE SSS TRIANGLE CONGRUENCE CRITERION

Does SSS Prove It?

Congruent · not congruent · cannot tell

FREE



Cut & Glue Sort — how to run it

25 minutes, including the cutting

1. **Hand out pages 3 and 4**, one of each per student, with scissors and glue. Nothing else is needed.
2. **Say this once:** *“Count the pairs of sides you know are equal. A side that belongs to both triangles counts as a pair. Three pairs go in the first row. If the numbers show sides that do not match, it goes in the second row. If neither is true, you know fewer than three pairs, and it goes in the last row.”*
3. **Check a sheet in ten seconds:** every row gets four pieces.

Student sheets	pages 3 and 4, one of each per student. Page 3 shows what tick marks mean and a side that belongs to two triangles.
Answers	page 5.

The last row is the one students miss. SSS needs three pairs of equal sides. Two pairs are not enough, even when the drawing looks exactly alike, and even when the two pairs are given as numbers. A shared side with only one ticked pair is just two pairs. A student who trusts the look puts these pieces in the first row.

The first row holds pieces that look wrong but are right. One kite has only two pairs ticked, but the middle side belongs to both triangles, so it is the third pair. One piece has the same three numbers in different places on the page. Students should pair the numbers, not the positions. One piece is a mirror image, and a mirror image is congruent.

The second row needs the numbers. A near miss (12 against 13) looks the same. Two triangles whose sides add up to the same total still have different sides. On two pieces, the ticked pairs match but the last sides are printed as different numbers, so the triangles cannot be congruent.

Your class may have met SSS in either of two ways. Some classes prove it with rigid motions. Others accept it as a starting fact. Every piece goes in the same row either way.

Guessing does not work. Every simple guessing rule, such as sorting by what kind of marks a piece has, places at most six of the twelve pieces correctly.



This is the free lesson this activity came from. The worksheet, the full answers and the lesson plan are on it, at three levels of difficulty.
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Does SSS prove it?

Three pairs of sides

Name _____

Period _____

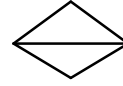
Date _____

Cut out the twelve pieces on the next page. Each piece shows two triangles. **Decide which row the piece belongs in, and glue it there.**

SSS: if three pairs of sides are equal, the two triangles are congruent. A flipped triangle counts. Count the pairs you are sure of. Do not trust how the drawing looks.



The same number of ticks means equal sides.



The middle side belongs to both triangles. It counts as one pair.

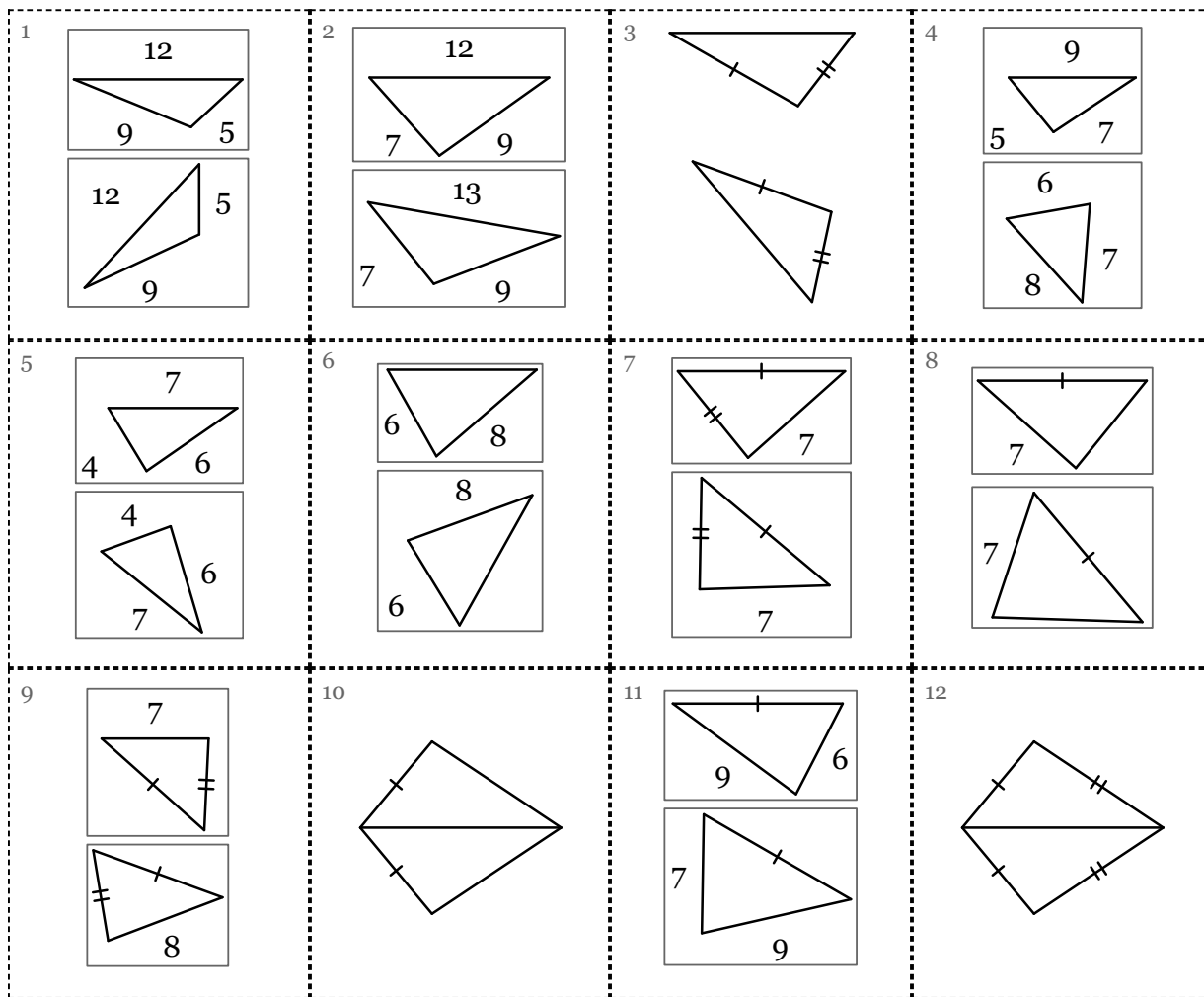
Congruent. SSS proves it: three pairs of sides are equal.

Not congruent. The side lengths do not match.

Cannot tell. Fewer than three pairs of sides are known to be equal.

The twelve pieces

Cut along the dotted lines



135 free geometry lessons — worksheets, worked answers and lesson plans.
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Cut & Glue Sort — answers

For the teacher

Congruent. SSS proves it: three pairs of sides are equal.	1 — Both triangles have sides 5, 9 and 12. Pair the numbers, not the places on the page.	5 — Both triangles have sides 4, 6 and 7. One is flipped over, and a flip is allowed.	7 — Two pairs are ticked, and the third sides are both 7. That is three pairs.	12 — Two pairs are ticked, and the middle side belongs to both triangles. That is the third pair.
Not congruent. The side lengths do not match.	2 — The sides are 7, 9, 12 and 7, 9, 13. The triangles look alike, but 12 is not 13.	4 — Both sets of sides add up to 21, but 5, 7, 9 and 6, 7, 8 are different lists.	9 — Two pairs are ticked, but the third sides are 7 and 8. The lists of sides cannot match.	11 — The ticked sides match and the 9s match, but the last sides are 6 and 7. They do not match.
Cannot tell. Fewer than three pairs of sides are known to be equal.	3 — Only two pairs are ticked. The drawing looks alike, but nothing marks the third pair.	6 — Only two pairs are known: the two sides of 6 and the two sides of 8. The third sides have no numbers.	8 — The ticks give one pair and the 7s give a second. Nothing is known about the third sides.	10 — One ticked pair and the shared middle side make only two pairs.

Every row holds four pieces. A piece goes in the first row when three pairs of sides are known to be equal. Tick marks, equal numbers and a side that belongs to both triangles each give a pair. It goes in the second row when the sides cannot match: put each triangle's sides in order, and the lists are different. It goes in the last row when fewer than three pairs are known and the lists cannot be compared.