

CUT & GLUE SORT

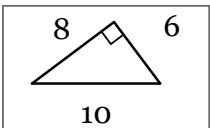
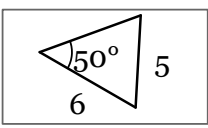
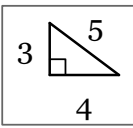
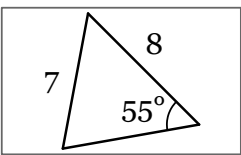
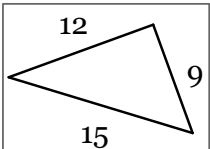
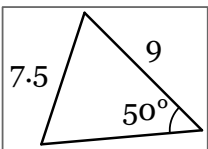
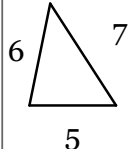
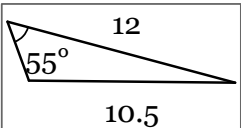


SSS AND SAS SIMILARITY

Similar, or What Is Missing?

Similar · the angle is in the wrong place · the sides are not in one ratio

FREE

1 	2 	3 	4 
			

Cut & Glue Sort — how to run it

25 minutes, including the cutting

1. **Hand out pages 3 and 4**, one of each per student. Scissors and glue.
2. **Say this once:** *“Sort the sides before you divide. For SAS Similarity, the equal angle must be between the two sides. Glue each piece in the row that says what you found.”*
3. **Check a sheet quickly:** every row has four pieces. A row with more or fewer has a piece in the wrong place.

Student sheets	pages 3 and 4, one of each per student. Page 3 shows SSS Similarity, SAS Similarity and AA as small drawings.
Answers	page 5.

The rows say what is missing. A pair is similar when SSS Similarity or SAS Similarity proves it. When neither does, one of two things is missing. In the second row, two pairs of sides are in one ratio and an angle is equal, but the angle is not between those two sides. Students who take “two ratios and any equal angle” as SAS Similarity glue all four of these into the first row. Two of them are drawn as similar triangles and the others are not, because these facts allow both.

In the third row the numbers do not divide to one factor. One pair has every side 2 longer. One pair has two ratios equal and the third not. Two pairs have the angle between the sides, but the two ratios differ. One of them is the two familiar right triangles with legs 8 and 6 and legs 12 and 5.

A student who never checks where the angle is gets eight pieces right. A student who never divides gets eight. Both have a row with too many pieces, so the equal rows show the mistake.

The names on these sheets. The sheets write SSS Similarity and SAS Similarity, so that they are not mixed up with the congruence criteria SSS and SAS. The angle criterion is written AA. Some textbooks write SSS~ and SAS~, or use other definitions, so tell the class which ones this sheet uses.



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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Similar, or What Is Missing?

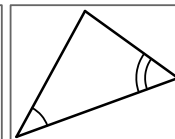
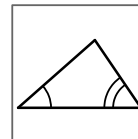
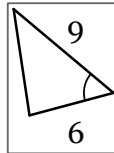
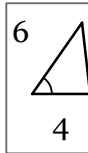
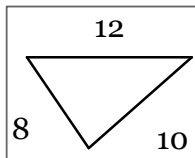
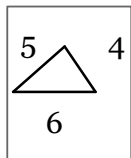
SSS and SAS Similarity

Name _____

Period _____

Date _____

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



SSS Similarity. All three pairs of sides are in the same ratio.

SAS Similarity. Two pairs of sides are in the same ratio, and the angles **between** them are equal.

AA. Two pairs of angles are equal.

Match the sides by size, not by the letters. Write each triangle's sides from longest to shortest. Then divide longest by longest, middle by middle, and shortest by shortest. The angle **between** two sides is at the corner where they meet. Use only the numbers and the marks. Do not judge by how the drawing looks.

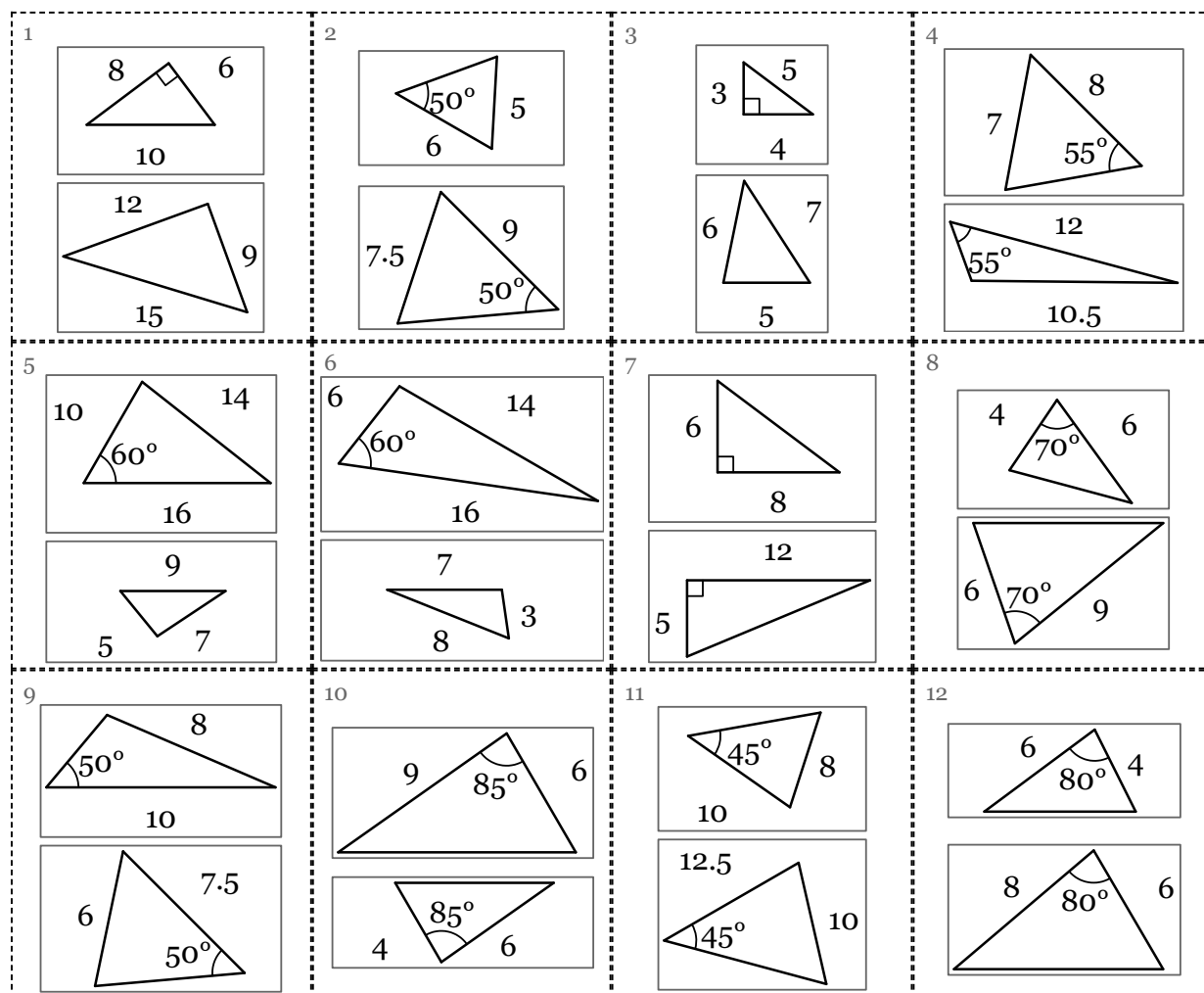
Similar. SSS Similarity or SAS Similarity proves it.

Not proved. The equal angle is not between the two sides.

Not similar. The sides are not in one ratio.

The twelve pieces

Cut along the dotted lines



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Cut & Glue Sort — answers

For the teacher

Similar. SSS Similarity or SAS Similarity proves it.	1 — Sorted: 10, 8, 6 and 15, 12, 9. Every quotient is 1.5, so SSS Similarity. The right-angle mark is extra.	6 — Sorted: 16, 14, 6 and 8, 7, 3. Every quotient is one half, so SSS Similarity. The 60° is extra.	8 — The 70° angles are between the numbered sides. $6 \div 4 = 9 \div 6 = 1.5$, so SAS Similarity.	10 — The 85° angles are between the numbered sides. $6 \div 9 = 4 \div 6$, two thirds, so SAS Similarity.
Not proved. The equal angle is not between the two sides.	2 — $9 \div 6 = 7.5 \div 5 = 1.5$, but the 50° angle is not between the two sides. Two different triangles fit these numbers.	4 — $12 \div 8 = 10.5 \div 7 = 1.5$, but the 55° angle is not between the two sides. These two triangles are not even similar.	9 — $7.5 \div 10 = 6 \div 8 = 0.75$, but the 50° angle is not between the two sides. These two triangles are not even similar.	11 — $12.5 \div 10 = 10 \div 8 = 1.25$, but the 45° angle is not between the two sides. Two different triangles fit these numbers.
Not similar. The sides are not in one ratio.	3 — Every side is 2 longer, but sorted 7 ÷ 5 is not 5 ÷ 3. Adding is not multiplying.	5 — Sorted: 16, 14, 10 and 9, 7, 5. $7 \div 14 = 5 \div 10$, one half, but $9 \div 16$ is not one half. The 60° is extra.	7 — Both have a right angle between the legs, but $12 \div 8$ is not $5 \div 6$. Two familiar right triangles are not always similar.	12 — The 80° angles are between the sides, but $8 \div 6$ is not $6 \div 4$. The sides are not in one ratio.

Every row holds four pieces. To place a piece, first find where the angle is. If an equal angle is printed and it is not where the two numbered sides meet, the piece goes in the second row. Otherwise sort each triangle's sides from longest to shortest and divide. If every quotient is the same number, the piece goes in the first row. If not, it goes in the third row.