

CUT & GLUE SORT

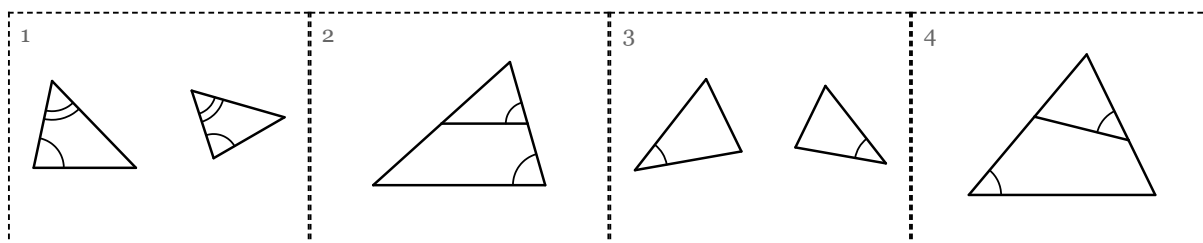


THE AA SIMILARITY CRITERION

Where Is the Second Pair of Angles?

Marked, hidden in the drawing, or not there at all

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:** *“Similar needs two pairs of equal angles. Some pairs are not marked. Look for a corner both triangles share, and for two segments that cross.”*
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 the AA rule and the places a second pair hides, as small drawings.
Answers	page 5.

The middle row is the point of the sheet. In those four pieces only one pair of angles is marked. The second pair is in the drawing: an angle both triangles share, or the two facing angles where two segments cross. Two right angles marked with small squares count as one pair. Many students look only for marks and miss these pairs. A student who does that gets eight of the twelve pieces right, and the rows come out uneven: the middle row stays empty. Ask that student to point to the angle both triangles share.

The last row is the lesson’s limit: one pair is never enough. Its pieces look like the middle row’s: one kind of mark, and triangles that look alike. In one, the arcs sit on the facing angles where the segments cross, so the crossing gives no extra pair. In two, equal angles are marked inside the same triangle. That says nothing about the other triangle. A drawing is not a measurement, so looking alike is not enough.

Guessing does not work: every simple guessing rule places at most six of the twelve pieces correctly.

What the sheets call the rule. Some classes prove the AA rule and call it a theorem. Other classes accept it without proof and call it a postulate. These sheets only use it, so they call it “the AA rule”: if two angles of one triangle are equal to two angles of another, the triangles are similar. Some textbooks 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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Where Is the Second Pair?

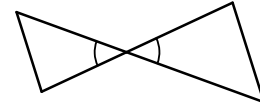
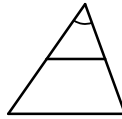
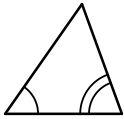
Similar, or cannot tell?

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.**



Two pairs of equal angles: **similar**.

An angle **both triangles share** is a pair.

Where two segments **cross**, the facing angles are a pair.

Angles with the same number of arcs are equal. With two pairs, the third pair is equal too, because the angles of a triangle add to 180° . A small square marks a right angle, and two right angles are a pair. **One pair alone is never enough.**

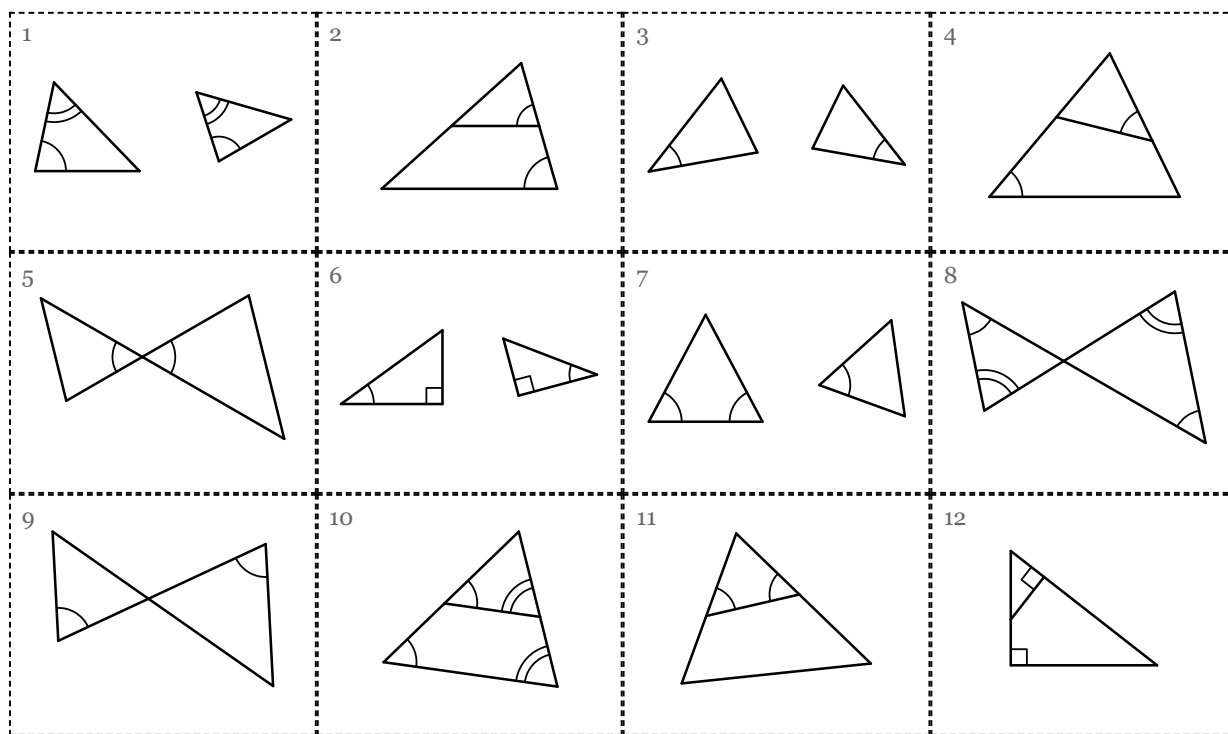
Similar. The marks show two pairs of equal angles.

Similar. The marks show one pair. The drawing gives the second pair.

Cannot tell. Only one pair of equal angles is known.

The twelve pieces

Cut along the dotted lines



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Cut & Glue Sort — answers

For the teacher

Similar. The marks show two pairs of equal angles.	1 — Two pairs: the pair marked with one arc, and the pair marked with two arcs. Both are marked.	6 — Two pairs: the pair marked with one arc, and the two right angles. Both are marked.	8 — Two pairs: the pair marked with one arc, and the pair marked with two arcs. Both are marked.	10 — Two pairs: the pair marked with one arc, and the pair marked with two arcs. Both are marked.
Similar. The marks show one pair. The drawing gives the second pair.	2 — Two pairs: the pair marked with one arc, and the angle both triangles share. Only the first is marked.	4 — Two pairs: the pair marked with one arc, and the angle both triangles share. Only the first is marked.	9 — Two pairs: the pair marked with one arc, and the facing angles where the segments cross. Only the first is marked.	12 — Two pairs: the angle both triangles share, and the two right angles. Only the second is marked.
Cannot tell. Only one pair of equal angles is known.	3 — Only one pair is known: the pair marked with one arc. The triangles look alike, but nothing marks a second pair.	5 — Only one pair is known: the facing angles where the segments cross, which the arcs mark. The lines look parallel, but no arrowheads say so.	7 — Two angles marked alike are in the same triangle. That says nothing about the other triangle. Only one pair is known across the two: the pair marked with one arc.	11 — Two angles marked alike are in the same triangle. That says nothing about the other triangle. Only one pair is known across the two: the angle both triangles share.

Every row holds four pieces. Angles with the same number of arcs are equal. A small square marks a right angle. A piece goes in the first row when its marks alone show two pairs of equal angles, one angle of each pair in each triangle. It goes in the middle row when the marks show one pair and the drawing gives the second: an angle both triangles share, or the facing angles where two segments cross. It goes in the last row when only one pair is known.

To check a piece with a student, ask: “Which two pairs?” Then point to each pair, one angle in each triangle.