

CUT & GLUE SORT



SIDE-ANGLE RELATIONSHIPS IN A TRIANGLE

True, False, or Cannot Tell?

Use the numbers, not the drawing

FREE

1 AB is the longest side.	2 AC is the longest side.	3 AB is 70 units long.
4 $\angle A$ is the largest angle.	5 AB is the longest side.	6 AB is the longest side.

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:** *“Use only the printed numbers. The drawings are not to scale. For each sentence, decide: true, false, or cannot tell.”*
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, as two small drawings, which side is opposite an angle, and that the largest angle is opposite the longest side.
Answers	page 5: every piece with its reason.

The rule, in both directions. In a triangle, the longest side is opposite the largest angle, and the largest angle is opposite the longest side. “Opposite” means the side does not touch the angle’s corner. Some pieces print angles and ask about sides. Others print sides and ask about angles.

The last row is the most important. The rule gives an order: which side is longer. It never gives a length, so “AB is 70 units long” cannot be decided from angles. One acute angle alone does not put the other two sides in order. Two sides out of three do not show which angle is the largest, because the third side could be the longest. A drawing with no numbers says nothing, because it is not drawn to scale.

Common mistakes. Four pieces print only two angles. A student who does not find the third angle gets three of them wrong. Remind students that the three angles add to 180° . Three drawings are drawn against their own numbers on purpose, so a student who trusts the drawing puts them in the wrong row. Many students also pick a side that touches the largest angle. Ask them to put a finger on the angle and slide it across the triangle to the side it does not touch. Guessing does not work: simple guessing rules place 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.
chooseyourlesson.com — 135 free geometry lessons.

True, false, or cannot tell?

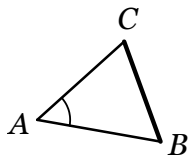
Sides and angles in one triangle

Name _____

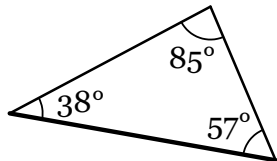
Period _____

Date _____

Cut out the twelve pieces on the next page. Each piece shows a triangle and a sentence about it. **Decide: is the sentence true, false, or can you not tell? Glue the piece in that row.**



The side **opposite** $\angle A$ is BC. It does not touch A.



The **largest** angle is opposite the **longest** side.

No drawing is drawn to scale. Use only the printed numbers. A drawing with no numbers does not show which side is longer.

If two angles are printed, find the third angle first. The three angles add to 180° .

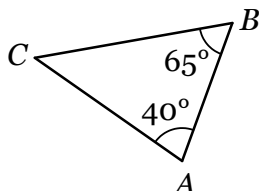
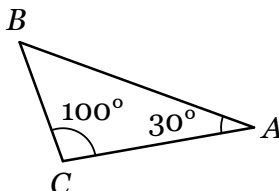
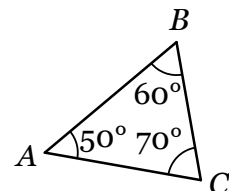
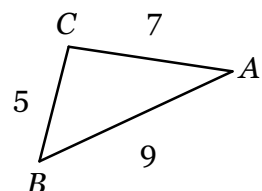
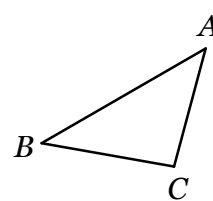
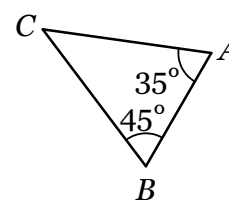
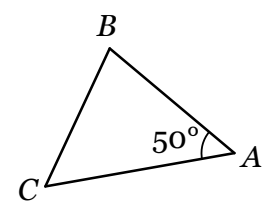
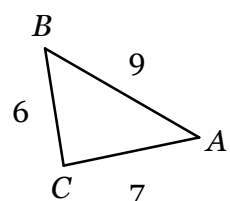
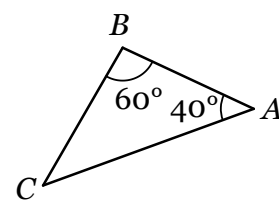
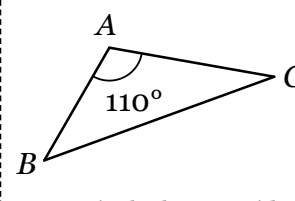
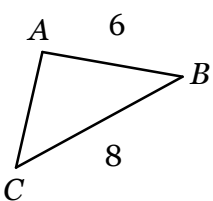
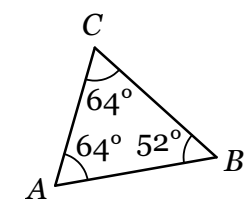
True. The printed numbers show that the sentence is right.

False. The printed numbers show that the sentence is wrong.

Cannot tell. The printed numbers are not enough to decide.

The twelve pieces

Cut along the dotted lines

 1 AB is the longest side.	 2 AC is the longest side.	 3 AB is 70 units long.	 4 $\angle A$ is the largest angle.
 5 AB is the longest side.	 6 AB is the longest side.	 7 AB is longer than AC.	 8 $\angle C$ is the largest angle.
 9 AC is the longest side.	 10 BC is the longest side.	 11 $\angle A$ is the largest angle.	 12 AB is longer than BC.



135 free geometry lessons — worksheets, worked answers and lesson plans.
chooseyourlesson.com

Cut & Glue Sort — answers

For the teacher

True	1 · “AB is the longest side.” $\angle C = 180^\circ - 40^\circ - 65^\circ = 75^\circ$, the largest angle. AB is across from $\angle C$, so AB is the longest side. The drawing is not to scale.	6 · “AB is the longest side.” $\angle C = 180^\circ - 35^\circ - 45^\circ = 100^\circ$, the largest angle. AB is across from $\angle C$, so AB is the longest side. The drawing is not to scale.	8 · “$\angle C$ is the largest angle.” $AB = 9$ is the longest side. $\angle C$ is across from AB, so $\angle C$ is the largest angle.	10 · “BC is the longest side.” $\angle A = 110^\circ$ is obtuse, so the other two angles are smaller. BC is across from $\angle A$, so BC is the longest side.
False	2 · “AC is the longest side.” $\angle C = 100^\circ$ is the largest angle. The side across from $\angle C$ is AB, not AC. AC touches the corner C.	4 · “$\angle A$ is the largest angle.” The longest side is $AB = 9$. The angle across from AB is $\angle C$, not $\angle A$. $\angle A$ is at one end of AB.	9 · “AC is the longest side.” $\angle C = 180^\circ - 40^\circ - 60^\circ =$ 80°, the largest angle. So AB is the longest side, not AC. The drawing is not to scale.	12 · “AB is longer than BC.” $\angle C = \angle A = 64^\circ$. AB is across from $\angle C$ and BC is across from $\angle A$, so $AB =$ BC. Neither is longer.
Cannot tell	3 · “AB is 70 units long.” The angles give the order of the sides, never their lengths. AB is the longest side, but it can be any length.	5 · “AB is the longest side.” No numbers are printed. The drawing is not to scale, so it does not show which side is longest.	7 · “AB is longer than AC.” Only $\angle A$ is known. $\angle B$ and $\angle C$ add to 130°, but either one can be the larger, so either side can be longer.	11 · “$\angle A$ is the largest angle.” CA is not given. If CA is longer than 8, $\angle B$ is the largest angle. If CA is shorter than 8, $\angle A$ is the largest.

Every row holds four pieces. To check a piece, first find any missing angle (the three angles add to 180°). Then match each angle with the side across from it, the side that does not touch its corner. The largest angle is across from the longest side, and equal angles are across from equal sides.

A piece goes in the last row when the numbers cannot decide the sentence: a length asked from angles, only one acute angle, only two of the three sides, or no numbers at all.