

CUT & GLUE SORT

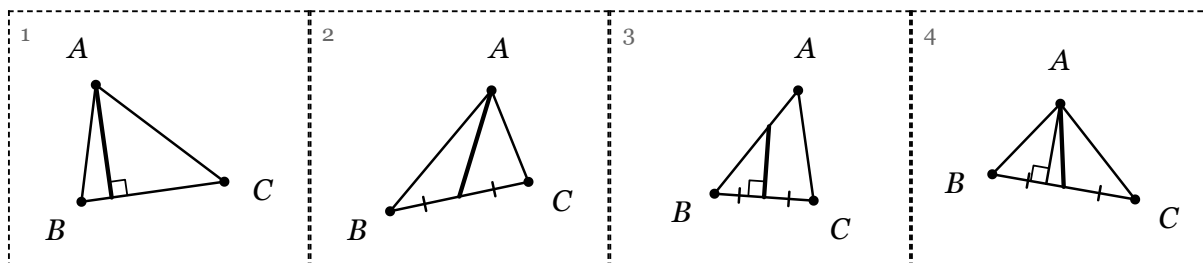


ALTITUDES AND THE ORTHOCENTER

Altitude, Median, or Neither?

12 triangles · read the marks

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:** *“The altitude to BC starts at A and meets BC at a right angle. The median to BC starts at A and goes to the middle of BC. Look only at the thick segment and the marks at its end.”*
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 small drawings, an altitude in an acute, an obtuse and a right triangle, and a median.
Answers	page 5.

What the rows test. The altitude to side BC is a segment from A, the corner across from BC. It meets BC, or the line BC lies on, at a right angle. The right-angle square at its end shows this. The median to BC also starts at A, but it ends at the middle of BC, and the tick marks show the two equal halves. Many students draw the median when they are asked for the altitude. The two look alike, and the median looks more natural.

On six pieces, two segments are drawn. One is thick and one is thin. The student has to find which mark belongs to the thick one. One altitude meets the dashed line outside an obtuse triangle. In one right triangle, side AB itself is the altitude to BC.

The last row is the hardest. It holds a perpendicular bisector of BC, which starts at the middle of BC and not at A. It holds a correct altitude to a different side, AC. It holds a segment from A with no marks. And it holds a segment in a right triangle whose right angle is at C, so side AC is the altitude to BC. Every simple guessing rule, such as “a square means altitude,” 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.
chooseyourlesson.com — 135 free geometry lessons.

Altitude, median, or neither?

Read the marks

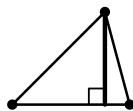
Name _____

Period _____

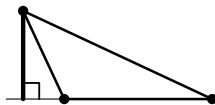
Date _____

Cut out the twelve pieces on the next page. Each piece shows a triangle ABC and one thick segment. **Decide which row the piece belongs in, and glue it there.**

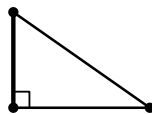
An **altitude** is a segment from a corner to the line of the opposite side. The right-angle square shows it meets that line at a right angle. In each drawing below, the thick segment is the one named.



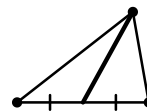
An **altitude** goes from a corner and meets the opposite side at a right angle.



It may meet the **line** of the side, outside the triangle (dashed).



In a right triangle, a **leg** is an altitude.



A **median** goes to the middle of the side (ticks). It is not an altitude.

Use only the marks. Do not measure. A mark counts only if it is at the end of the thick segment, on side BC or its dashed line.

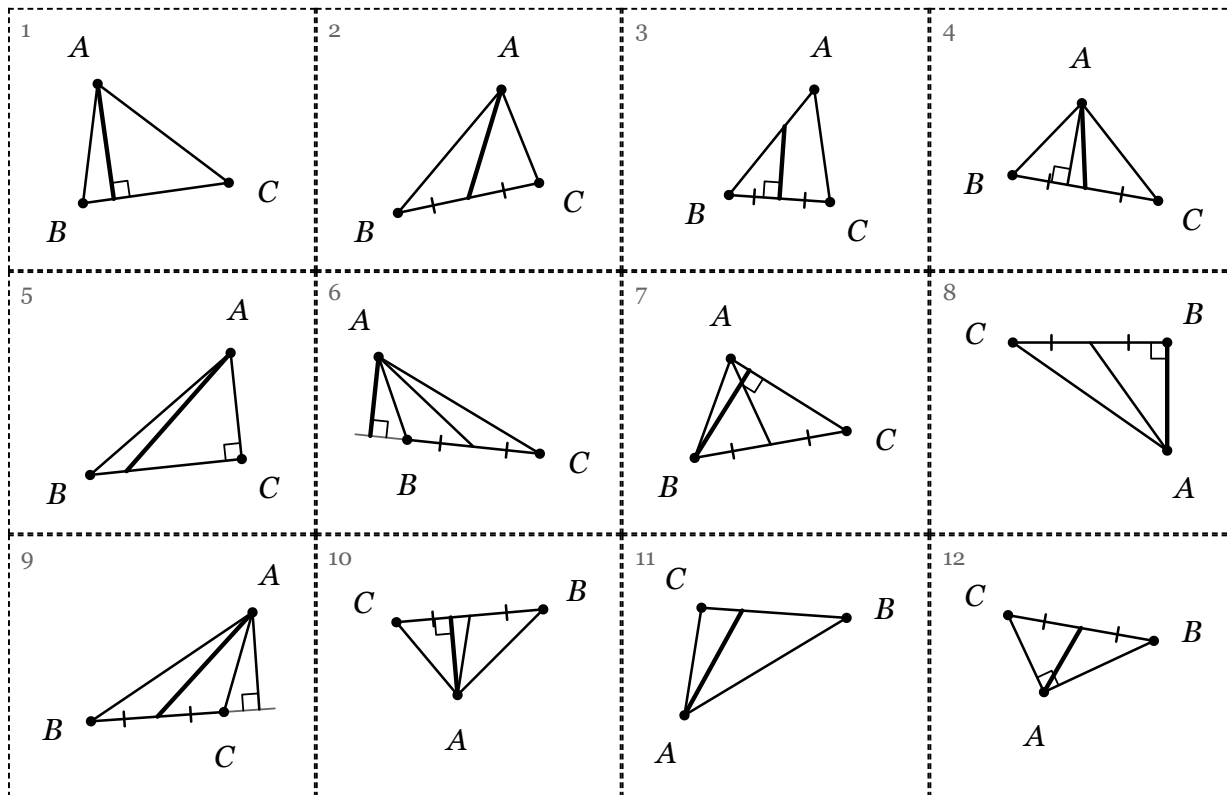
The thick segment is **the altitude to side BC**.

The thick segment is **the median to side BC**.

The marks show **neither** of these.

The twelve pieces

Cut along the dotted lines



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

Cut & Glue Sort — answers

For the teacher

Altitude to BC	1 — It starts at A and meets BC at the square. That is the altitude to BC.	6 — The thick segment starts at A and meets the dashed line of BC at the square. The foot is outside the triangle because the angle at B is obtuse. The thin segment with the ticks is the median.	8 — The thick segment is side AB. The square at B shows AB is perpendicular to BC, and AB starts at A. So side AB is the altitude to BC.	10 — The thick segment starts at A and meets BC at the square. The thin segment goes to the middle of BC (the ticks), so it is the median.
Median to BC	2 — It starts at A and the ticks show it goes to the middle of BC. No square is drawn at its end.	4 — The thick segment goes to the middle of BC (the ticks). The square belongs to the thin segment, which is the altitude.	9 — The thick segment goes to the middle of BC (the ticks). The thin segment meets the dashed line of BC at the square, so the thin one is the altitude.	12 — The ticks show it goes to the middle of BC. The square at A is the right angle of the triangle. It is where the segment starts, not where it meets BC.
Neither	3 — It has the square and the ticks, but it starts at the middle of BC, not at A. It is the perpendicular bisector of BC.	5 — The square is at C. So side AC is perpendicular to BC, and AC is the altitude to BC. The thick segment is a different segment, and no ticks show the middle of BC.	7 — It starts at B and meets side AC at the square. It is the altitude to AC, not to BC.	11 — It starts at A and ends on BC, but it has no marks. No square shows a right angle, and no ticks show the middle of BC.

Every row holds four pieces. To check a piece with a student, ask three questions about the thick segment. Does it start at A? Where does it end: at a square on BC (or its dashed line), or at the middle of BC? Which segment does each mark belong to? If it starts at A and the square is at its end, it is the altitude. If it starts at A and the ticks put its end at the middle of BC, it is the median. Otherwise it is neither.