

ANSWER MAZE



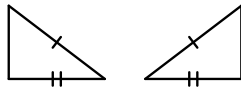
RIGHT TRIANGLE CONGRUENCE: HL

HL or Not?

One page · 10–15 minutes · nothing to prepare

FREE

5

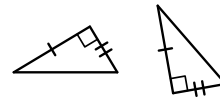


HL. The corners are square, and two pairs of sides match. → go to 3

Not settled. No small square is drawn. → go to 2

Look in every corner of both triangles for a small square.

2



HL. Both triangles have a right angle. → go to 6
SAS. The right angle is between the legs. → go to 7

Trace each ticked side. Check whether it touches the small square.

1. **Hand out page 3**, one per student. Nothing else is needed.
2. **Say this once:** *“Start at box 5. Find the small square in each triangle before you choose. Write every box number in the row at the bottom as you go.”*
3. **Check a sheet quickly.** A student with no mistakes writes **5 2 7 4 1 8**: six boxes, then out.

Student sheet	page 3, one per student. It shows the HL, SAS and AAS marks on three small right triangles.
Answers	page 4.

Every wrong answer comes from one of two mistakes. The first is using HL without checking it. HL needs a right angle given in both triangles (a small square, or words), the two hypotenuses matched, and one pair of legs matched. The hypotenuse is the side across from the right angle, and in the written boxes the right angle is not always at C. These wrong answers send the student to box 3.

The second mistake is writing HL for every pair of right triangles. Two matching legs give SAS, and a hypotenuse with a matching angle gives AAS. The opposite slip also belongs here: when two triangles share a side, that side is a leg of both and matches itself, even with no tick on it. These wrong answers send the student to box 6. Boxes 3 and 6 ask the same kind of question again, and both of their answers lead back to the route.

The row at the bottom is the check. A clean run is six numbers. Each wrong answer adds at least one more. Guessing does not get a student out: every simple guessing rule, such as always taking the first answer, goes wrong within the first three boxes.



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.

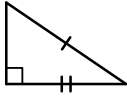
Answer Maze

Start at box 5 · HL, SAS, AAS, or not settled?

Name _____

Period _____

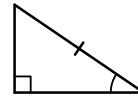
Date _____



HL Both have the small square. The **hypotenuses** match, and one pair of **legs** match.



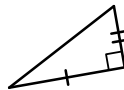
SAS The small square is **between** the two marked legs.



AAS The small square, one more angle, and the hypotenuse.

The **hypotenuse** is the side across from the small square. The other two sides are the **legs**. A right angle counts only when it has the small square. Sides with the same ticks are equal. A side that two triangles share matches itself. **What proves the two triangles congruent?** Choose an answer, and go to the box it names.

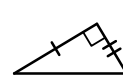
1



HL. Each triangle has a small square. → go to 3
Not settled. A hypotenuse is matched with a leg. → go to 8

In each triangle, find the side across from the small square.

2



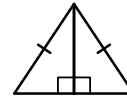
HL. Both triangles have a right angle. → go to 6
SAS. The right angle is **between** the legs. → go to 7
Trace each ticked side. Check whether it touches the small square.

3

In $\triangle ABC$ and $\triangle DEF$:
Right angle at C only $AB \cong DE$
 $AC \cong DF$

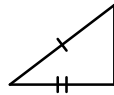
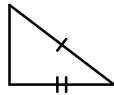
Not settled. $\triangle DEF$ has no right angle given. → go to 2
HL. AB is across from the right angle at C. → go to 5
Read the line about the right angle again, for each triangle.

4



HL. The shared side is a leg of both. → go to 1
Not settled. Only one pair of sides has ticks. → go to 6
Count the marked sides, and the side the two triangles share.

5



HL. The corners are square, and two pairs of sides match. → go to 3
Not settled. No small square is drawn. → go to 2
Look in every corner of both triangles for a small square.

6



HL. The two triangles share a side. → go to 2
SAS. The legs meet at the small square. → go to 7
Trace each ticked side to its two ends.

7

In $\triangle ABC$ and $\triangle DEF$:
Right angles at B and E $AC \cong DF$
 $BC \cong EF$

HL. The side across from B is AC. → go to 4
Not settled. The side across from C is not given. → go to 3
The side across from the right angle uses the other two letters.

8

In $\triangle ABC$ and $\triangle DEF$:
Right angles at C and F $\angle A \cong \angle D$
 $AB \cong DE$

AAS. Two angles and the side AB. → you are out
HL. AB is across from the right angle. → go to 6
Find the right angle. Check which letters the given side uses.

Write each box number as you reach it:

--	--	--	--	--	--	--	--	--



135 free geometry lessons
chooseyourlesson.com

The route, in order. Boxes 3 and 6 are not on it. A student reaches them only by a wrong answer. They are the last two rows of the table.

5 → 2 → 7 → 4 → 1 → 8 → out

	Box	Right answer, and why	Wrong answer, and why a student picks it
1	Box 5	Not settled. No small square is drawn. The corners look square, but no small square is drawn, so no right angle is given. HL cannot be used.	“HL. The corners are square, and two pairs of sides match.” goes to box 3. A student who takes the right angle from the look of the drawing picks this.
2	Box 2	SAS. The right angle is between the legs. Both marked sides touch the small square, so they are legs, and the right angle is between them. That is SAS.	“HL. Both triangles have a right angle.” goes to box 6. A student who writes HL for every pair of right triangles picks this.
3	Box 7	HL. The side across from B is AC. The right angles are at B and E, so the hypotenuse of $\triangle ABC$ is AC, the side across from B. $AC \cong DE$ is given, and BC is a leg.	“Not settled. The side across from C is not given.” goes to box 3. A student who expects the right angle at C looks for AB as the hypotenuse and picks this.
4	Box 4	HL. The shared side is a leg of both. Both triangles have the small square. The one-tick sides are the hypotenuses. The side the triangles share is a leg of both, and it matches itself.	“Not settled. Only one pair of sides has ticks.” goes to box 6. A student who looks for ticks on every side, and forgets that a shared side matches itself, picks this.
5	Box 1	Not settled. A hypotenuse is matched with a leg. In the first triangle the one-tick side is across from the square, so it is the hypotenuse. In the second it touches the square, so it is a leg. The triangles are really different sizes.	“HL. Each triangle has a small square.” goes to box 3. A student who checks the small squares but not which side is the hypotenuse picks this.
6	Box 8	AAS. Two angles and the side AB. Two pairs of angles are given (the right angles and $\angle A \cong \angle D$) and one pair of sides, AB and DE, which is not between them. No pair of legs is given, so it is AAS, not HL.	“HL. AB is across from the right angle.” goes to box 6. A student who sees a right angle and a hypotenuse and writes HL picks this.
	Box 3	Not settled. $\triangle DEF$ has no right angle given. A right angle is given only at C. Nothing says $\triangle DEF$ has a right angle, and HL needs one in both triangles.	“HL. AB is across from the right angle at C.” goes to box 5. A student who checks only the first triangle picks this.
	Box 6	SAS. The legs meet at the small square. The shared side is a leg of both triangles, and the one-tick sides are the other legs. Two legs with the right angle between them is SAS.	“HL. The two triangles share a side.” goes to box 2. A student who writes HL whenever two right triangles share a side picks this.

How to check any box. First find the right angle in each triangle: a small square, or the words “right angle”. If one is missing, nothing is settled by HL. The hypotenuse is the side across from the right angle. If the two hypotenuses match and a pair of legs match, it is HL. If both matching sides are legs, it is SAS. If the matching parts are the hypotenuse and an angle, it is AAS.

A student can find the last four boxes of the route by following the arrows backward from “you are out.” So ask a student with a clean row to explain one box.