

ANSWER MAZE

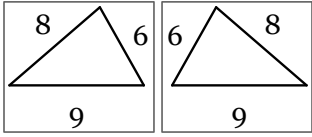
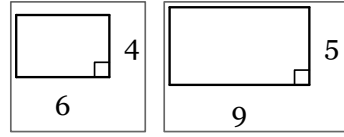


SIMILARITY TRANSFORMATIONS AND SIMILAR FIGURES

Similar or Not? Read the Numbers

One page · 10–15 minutes · nothing to prepare

FREE

3  No. They are the same size, so only congruent. → go to 7 Yes. Congruent shapes have scale factor 1. → go to 6 <i>Pair each number with one on the other triangle.</i>	6  No. $6 \times 1.5 = 9$, but $4 \times 1.5 = 6$, not 5. → go to 1 Yes. Every angle is 90° in both rectangles. → go to 5 <i>Find the number that turns the first long side into the second one.</i>
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1. **Hand out page 3**, one per student. Nothing else is needed.
2. **Say this once:** *“Start at box 3. Check the angles, and check that one number multiplies every side. Shapes of the same size are similar too. Write every box number in the row at the bottom as you go.”*
3. **Check a sheet quickly.** A student with no mistakes writes **3 6 1 8 4 2**: six boxes, then out.

Student sheet	page 3, one per student.
Answers	page 4.

Every wrong answer comes from one of two mistakes. The first mistake is judging by the size or the look of the shapes. The student says a congruent pair is not similar, says a smaller copy is not similar, or passes a triangle stretched one way because it looks like the same kind of triangle. These wrong answers send the student to box 7. The second mistake is checking only half, or adding instead of multiplying. The student passes two rectangles because their angles match, a square and a rhombus because one number multiplies every side, or rejects a similar pair because one side grew by 3 and the other by 2. These wrong answers send the student to box 5. Boxes 7 and 5 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. The hint in every box says what to look at, never which answer is right.

Which definition of similar these sheets use. Your class may have learned either one. One says a dilation followed by slides, turns or flips moves one shape exactly onto the other. The other says every pair of matching angles is equal and every pair of matching sides is in the same ratio. The student sheet prints both, and both give the same answer on every item. Some textbooks use other definitions, so tell the class which ones this sheet uses.

Guessing does not get a student out. Every simple guessing rule, such as always taking the first answer, goes wrong within the first four 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.
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Answer Maze

Start at box 3 · similar or not?

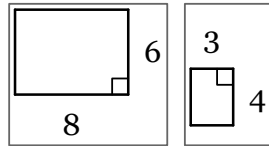
Name _____

Period _____

Date _____

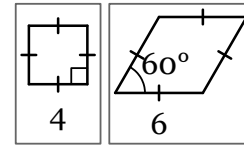
Are the two shapes similar? Every box asks this. **Similar** means every angle matches and every side is multiplied by the same number. That is the same as a dilation, then slides, turns or flips, moving one shape exactly onto the other. Congruent shapes are similar too, with scale factor 1. Choose an answer, and go to the box it names.

1



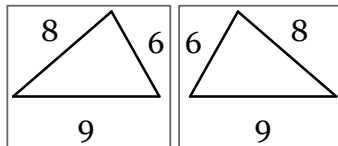
Yes. Every side is multiplied by 0.5. → go to 8
No. The second one is smaller. → go to 7
Read both numbers on each rectangle, long with long.

2



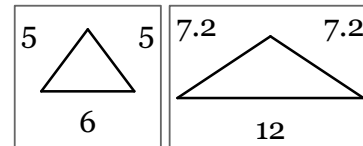
Yes. Every side is multiplied by 1.5. → go to 5
No. Only the square has 90° angles. → you are out
Look at the corners as well as the side numbers.

3



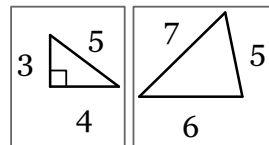
No. They are the same size, so only congruent. → go to 7
Yes. Congruent shapes have scale factor 1. → go to 6
Pair each number with one on the other triangle.

4



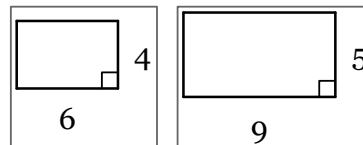
No. $6 \times 2 = 12$, but $5 \times 2 = 10$, not 7.2. → go to 2
Yes. It is just a wider copy. → go to 7
Check the base and the slanted sides one at a time.

5



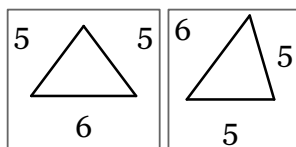
No. Adding 2 to every side is not multiplying. → go to 1
Yes. Every side grew by 2. → go to 3
Divide matching sides instead of subtracting them.

6



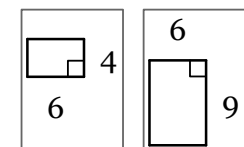
No. $6 \times 1.5 = 9$, but $4 \times 1.5 = 6$, not 5. → go to 1
Yes. Every angle is 90° in both rectangles. → go to 5
Find the number that turns the first long side into the second one.

7



No. They stand on different sides. → go to 3
Yes. It is the same triangle, turned. → go to 6
Pair each number with one on the other shape.

8



No. The sides grew by 3 and by 2. → go to 5
Yes. Every side is multiplied by 1.5. → go to 4
Divide each side of the second rectangle by its partner on the first.

Write each box number as you reach it:

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Answer Maze — answers

For the teacher

The route, in order. Boxes 7 and 5 are not on it. A student reaches them only by a wrong answer.

3 → 6 → 1 → 8 → 4 → 2 → out

Box and question	Right answer, and why	Wrong answer, and why a student picks it
1 Box 3 Are the two shapes similar? A triangle with sides 6, 8 and 9, and its mirror image with the same sides.	Yes. Congruent shapes have scale factor 1. Both have sides 6, 8 and 9, so they are congruent. Congruent shapes are similar.	“No. They are the same size, so only congruent.” goes to box 7. A student who thinks “similar” must mean a different size picks this.
2 Box 6 Are the two shapes similar? A 6 by 4 rectangle and a 9 by 5 rectangle.	No. $6 \times 1.5 = 9$, but $4 \times 1.5 = 6$, not 5. Every angle matches, but the long sides are multiplied by 1.5 and the short sides by 1.25.	“Yes. Every angle is 90° in both rectangles.” goes to box 5. A student who checks the angles and not the sides picks this.
3 Box 1 Are the two shapes similar? An 8 by 6 rectangle, and a smaller 4 by 3 rectangle standing on its short side.	Yes. Every side is multiplied by 0.5. Every angle is 90° , $8 \times 0.5 = 4$ and $6 \times 0.5 = 3$. A smaller shape can be similar.	“No. The second one is smaller.” goes to box 7. A student who thinks the second shape must be the bigger one picks this.
4 Box 8 Are the two shapes similar? A 6 by 4 rectangle and a 9 by 6 rectangle, standing on its short side.	Yes. Every side is multiplied by 1.5. Every angle is 90° , $6 \times 1.5 = 9$ and $4 \times 1.5 = 6$. Sides are multiplied, not added to.	“No. The sides grew by 3 and by 2.” goes to box 5. A student who subtracts the sides instead of dividing them picks this.
5 Box 4 Are the two shapes similar? A triangle with a base of 6 and two sides of 5, and a wider one with a base of 12 and two sides of 7.2.	No. $6 \times 2 = 12$, but $5 \times 2 = 10$, not 7.2. The base is multiplied by 2 and the slanted sides are not. It was stretched one way only.	“Yes. It is just a wider copy.” goes to box 7. A student who judges “same shape” by eye picks this.
6 Box 2 Are the two shapes similar? A square with sides of 4, and a rhombus with sides of 6 and a 60° angle.	No. Only the square has 90° angles. Every side is multiplied by 1.5, but the rhombus has a 60° angle.	“Yes. Every side is multiplied by 1.5.” goes to box 5. A student who checks the sides and not the angles picks this.
Box 7 Are the two shapes similar? A triangle with a side of 6 and two sides of 5, and the same triangle standing on a side of 5.	Yes. It is the same triangle, turned. Both have a side of 6 and two sides of 5, so they are congruent, and a turn is allowed.	“No. They stand on different sides.” goes to box 3. A student who judges by how the shape stands picks this.
Box 5 Are the two shapes similar? A right triangle with sides 3, 4 and 5, and a triangle with sides 5, 6 and 7.	No. Adding 2 to every side is not multiplying. $4 \times 1.5 = 6$, but $3 \times 1.5 = 4.5$, not 5. No one number multiplies every side.	“Yes. Every side grew by 2.” goes to box 6. A student who adds instead of multiplying picks this.

Yes is right only when every angle matches and one number multiplies every side. The arrows, followed backward from “you are out,” show the last four boxes of the route. So ask a student with a clean row to explain one box.