LESSON MAKER PRO

Triangle Scale Check

Use sides and angles to test similarity.

HIGH SCHOOL · MT.CORE.GEOM.TRANS.3

MT.CORE.GEOM.TRANS.3 "Define the similarity of two figures in terms of similarity transformations by: Verifying that two triangles are similar if, and only if, corresponding pairs of sides are proportional and corresponding pairs of angles are congruent..."

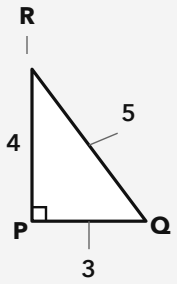
NAME _____ DATE _____

THE BIG IDEA

Triangles are similar when a dilation and a rigid motion can match them. Then corresponding sides have the same ratio, and corresponding angles are equal. Two matching angle pairs are enough: the third pair must match because each triangle's angles sum to 180°.

WORKED EXAMPLE

A second right triangle has legs 6 and 8 and a hypotenuse of 10. Is it similar to the triangle shown?



1. Match the sides: 6/3 = 8/4 = 10/5 = 2.
2. Dilate the shown triangle by 2 to get sides 6, 8, and 10.
3. A rigid motion can then match the triangles, so their angles match too.

Answer: Yes. The scale factor from the shown triangle is 2.

PRACTICE 4 problems

1 Triangles have corresponding sides 11, 13, 17 and 22, 26, 34. Are they similar? Give the scale factor from the first triangle.

ANSWER _____

2 One triangle has angles 37° and 79°. Another has angles 37° and 64°. Are they similar? Use AA.

ANSWER _____

3 Triangles have corresponding sides 7, 16, 19 and 14, 32, 39. Are they similar? Give one reason.

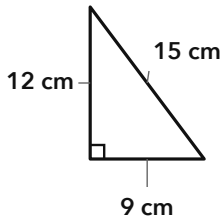
ANSWER _____

4 Two triangles each have angles 44° and 83°. Explain in one sentence why a similarity transformation can match them.

ANSWER _____

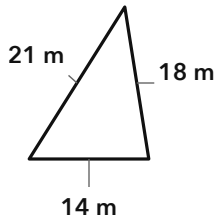
APPLY IT Show your work

1 A larger version of the triangular logo shown has sides 27 cm, 36 cm, and 45 cm. Is it similar to the logo? Find the scale factor.



ANSWER _____

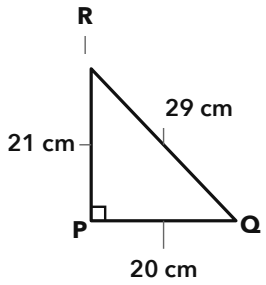
2 On a game map, the shortest side of the zone shown becomes 35 m. How long is the enlarged longest side?



ANSWER _____

CHALLENGE One step up

A second right triangle has an acute angle equal to angle Q. Its legs corresponding to the shown legs are 40 cm and 42 cm, but its hypotenuse is listed as 60 cm. Is that possible? Explain using AA and dilation.



WORK SPACE AND ANSWER

ANSWER KEY

Triangle Scale Check

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Triangles have corresponding sides 11, 13, 17 and 22, 26, 34. Are they similar? Give the scale factor from the first triangle.	**Yes. The scale factor is 2.**
2	One triangle has angles 37° and 79°. Another has angles 37° and 64°. Are they similar? Use AA.	**Yes. The missing angles are 64° and 79°, so two angle pairs match.**
3	Triangles have corresponding sides 7, 16, 19 and 14, 32, 39. Are they similar? Give one reason.	**No. The first two side ratios are 2, but 39/19 is not 2.**
4	Two triangles each have angles 44° and 83°. Explain in one sentence why a similarity transformation can match them.	**Their third angles are both 53°, so AA guarantees that a dilation and a rigid motion can match them.**

PART 2 · APPLY IT

1. **Yes. The scale factor is 3.** The corresponding side ratios are 27/9 = 36/12 = 45/15 = 3. A dilation by 3 makes the side lengths match.
2. **52.5 m** The scale factor is 35/14 = 5/2. The longest side becomes 21 × 5/2 = 52.5 m.

CHALLENGE

No. The shared right angle and angle Q make the triangles similar by AA. Both legs are twice as long, so the hypotenuse must be 2 × 29 = 58 cm, not 60 cm.

Accept equivalent side-ratio explanations. In the challenge, students may instead use the Pythagorean theorem to show that the listed hypotenuse is impossible.