LESSON MAKER PRO

Triangle Scale Sleuth

Use matching sides to prove and solve.

HIGH SCHOOL · GEO-G.SRT.5.b

GEO-G.SRT.5.b "Prove relationships in geometric figures."

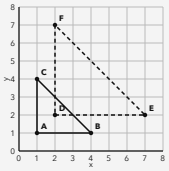
NAME _____ DATE _____

SIDE RATIOS SHOW SIMILARITY

If all three pairs of corresponding sides have the same ratio, the triangles are similar by SSS similarity. Use that scale factor to find a missing matching side. If the scale factor is 1, the triangles are congruent.

WORKED EXAMPLE

Use the grid. Are triangles ABC and DEF similar? Find the scale factor from ABC to DEF.



1. AB = AC = 3, and BC = 3sqrt(2).
2. DE = DF = 5, and EF = 5sqrt(2).
3. Each image side is 5/3 times its matching original side.

Answer: Yes. The scale factor from ABC to DEF is 5/3.

PRACTICE 4 problems

1 Triangle JKL is similar to triangle MNP. JK = 9, MN = 15, and KL = 12. Find NP.

ANSWER _____

2 Triangle QRS is similar to triangle TUV. QR = 13, TU = 26, RS = x + 15, and UV = 52. Find x.

ANSWER _____

3 Triangle A has side lengths 18, 27, and 36. Triangle B has side lengths 22, 33, and 44. Are the triangles similar? State the scale factor from A to B.

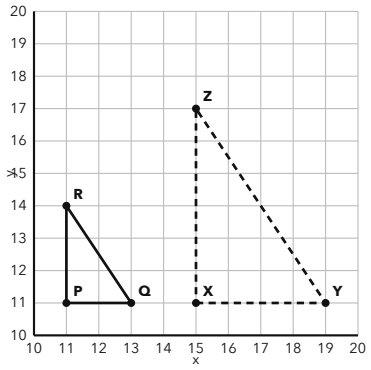
ANSWER _____

4 Two triangles each have side lengths 19 and 23 with an included angle of 65 degrees. Which congruence criterion proves the triangles congruent?

ANSWER _____

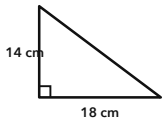
APPLY IT Show your work

1 A game club enlarges a triangular logo. The grid shows original triangle PQR and enlarged triangle XYZ. What scale factor was used? A matching original edge is 25 cm long. Find its enlarged length.



ANSWER _____

2 The small phone-stand triangle is shown. A similar large stand has a vertical leg of 35 cm. Find its base length.



ANSWER _____

CHALLENGE One step up

A student says triangles with side lengths 15, 20, 25 and 21, 28, 35 are congruent because their side ratios match. Is the student correct? Explain.

WORK SPACE AND ANSWER

ANSWER KEY

Triangle Scale Sleuth

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Triangle JKL is similar to triangle MNP. JK = 9, MN = 15, and KL = 12. Find NP.	**20**
2	Triangle QRS is similar to triangle TUV. QR = 13, TU = 26, RS = x + 15, and UV = 52. Find x.	**11**
3	Triangle A has side lengths 18, 27, and 36. Triangle B has side lengths 22, 33, and 44. Are the triangles similar? State the scale factor from A to B.	**Yes. The scale factor is 11/9.**
4	Two triangles each have side lengths 19 and 23 with an included angle of 65 degrees. Which congruence criterion proves the triangles congruent?	**SAS**

PART 2 · APPLY IT

1. **Scale factor: 2. Enlarged edge: 50 cm.** PQ is 2 units and XY is 4 units, so the scale factor is 2. Multiply 25 by 2.
2. **45 cm** The scale factor is 35/14 = 5/2. Multiply the 18 cm base by 5/2.

CHALLENGE

No. The triangles are similar by SSS because each side is multiplied by 7/5, but they are not congruent because their corresponding side lengths are different.

Accept equivalent scale factors, such as 2.5 for 5/2. For the challenge, students must distinguish similar from congruent and support the claim with the common ratio.