

Scale It Right

Use matching sides to solve congruence and similarity problems.

HIGH SCHOOL • MA.912.GR.1.6

MA.912.GR.1.6 "Solve mathematical and real-world problems involving congruence or similarity in two-dimensional figures."

NAME _____

DATE _____

MATCH, THEN SCALE

For similar figures, matching side lengths have the same scale factor. Divide a known side in the second figure by its matching side in the first figure, then multiply every matching side by that factor. For congruent figures, matching sides have equal lengths.

WORKED EXAMPLE

Rectangle A measures 7 cm by 11 cm. Similar rectangle B has a shorter side of 14 cm. Find the longer side of rectangle B.

1. Scale factor = $14/7 = 2$.
2. Multiply the matching long side: $11 \times 2 = 22$.

Answer: 22 cm

PRACTICE 6 problems

- 1** Triangles ABC and DEF are similar. AB = 5 cm corresponds to DE = 15 cm. BC = 8 cm corresponds to EF = x. Find x.

ANSWER _____

- 2** Rectangle R is 9 cm wide and 18 cm long. A similar rectangle S is 12 cm wide. Find its length x.

ANSWER _____

- 3** Triangle PQR is congruent to triangle XYZ, with P corresponding to X, Q to Y, and R to Z. PR = 19 cm. Find XZ.

ANSWER _____

- 4** Similar triangles have corresponding side lengths of 6 cm and 9 cm. A 20 cm side on the first triangle matches x on the second triangle. Find x.

ANSWER _____

- 5** A 25 cm side of Figure A matches a 40 cm side of similar Figure B. What is the scale factor from A to B? Give a simplified fraction.

ANSWER _____

- 6** A rectangle measures 4 cm by 13 cm. A similar rectangle has a matching 4 cm side that measures 16 cm. Find the length matching the 13 cm side.

ANSWER _____

APPLY IT Show your work

- 1** A student designs a skateboard deck graphic that is 16 cm wide and 24 cm long. A shop makes a similar display graphic that is 20 cm wide. How long is the display graphic?

WORK SPACE

ANSWER _____

- 2** For a school festival, student council members make 8 congruent triangular pennants. Each pennant has side lengths of 9 cm, 12 cm, and 15 cm. How many centimeters of ribbon are needed to outline all the pennants, with no extra ribbon?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Triangle A has side lengths of 9 cm, 12 cm, and 15 cm. Similar triangle B has a perimeter of 60 cm. Find the side lengths of triangle B and explain your reasoning.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Triangles ABC and DEF are similar. AB = 5 cm corresponds to DE = 15 cm. BC = 8 cm corresponds to EF = x. Find x.	24 cm
2	Rectangle R is 9 cm wide and 18 cm long. A similar rectangle S is 12 cm wide. Find its length x.	24 cm
3	Triangle PQR is congruent to triangle XYZ, with P corresponding to X, Q to Y, and R to Z. PR = 19 cm. Find XZ.	19 cm
4	Similar triangles have corresponding side lengths of 6 cm and 9 cm. A 20 cm side on the first triangle matches x on the second triangle. Find x.	30 cm
5	A 25 cm side of Figure A matches a 40 cm side of similar Figure B. What is the scale factor from A to B? Give a simplified fraction.	8/5
6	A rectangle measures 4 cm by 13 cm. A similar rectangle has a matching 4 cm side that measures 16 cm. Find the length matching the 13 cm side.	52 cm

PART 2 • APPLY IT

- 30 cm** The scale factor is $20/16 = 5/4$. Multiply 24 by $5/4$ to get 30 cm.
- 288 cm** Each pennant has a perimeter of $9 + 12 + 15 = 36$ cm. Multiply 36 cm by 8 pennants.

CHALLENGE

15 cm, 20 cm, and 25 cm. Triangle A has a perimeter of 36 cm, so the scale factor is $60/36 = 5/3$. Multiply each side of triangle A by $5/3$.

For the scale-factor item, require the simplified fraction $8/5$ as requested. In the challenge, accept the side lengths in corresponding order with a valid perimeter-based scale-factor explanation.