

Scale It Right

Use matching sides and angles to solve similar figures.

GRADE 7 • 7.MG.2

7.MG.2 "The student will solve problems and justify relationships of similarity using proportional reasoning. Identify corresponding congruent angles of similar quadrilaterals and triangles, through the use of geometric markings..."

NAME _____

DATE _____

MATCH AND SCALE

Similar figures have congruent corresponding angles, and their corresponding side lengths are multiplied by the same scale factor. Match the vertices in order, then use a ratio of matching sides to find a missing length.

WORKED EXAMPLE

Triangles ABC and DEF are similar.
AB = 13, BC = 17, and DE = 26. Find EF.

1. AB corresponds to DE, so the scale factor from ABC to DEF is $26/13 = 2$.
2. BC corresponds to EF, so $EF = 17 \times 2$.
3. $EF = 34$.

Answer: EF = 34

PRACTICE 6 problems

- 1** In triangles ABC and DEF, angle A and angle D have one arc marking, angle B and angle E have two arc markings, and angle C and angle F have three arc markings. Name all pairs of corresponding sides.

ANSWER _____

- 2** Quadrilateral PQRS is similar to quadrilateral WXYZ. Write a proportion that compares all corresponding side lengths.

ANSWER _____

- 3** Triangle LMN is similar to triangle RST. LM = 9, RS = 15, MN = 12, and ST = x. Find x.

ANSWER _____

- 4** Triangle X has side lengths 6, 10, and 14. Triangle Y has matching side lengths 9, 15, and 21. Are the triangles similar? State the scale factor from X to Y.

ANSWER _____

- 5** Triangle JKL is similar to triangle MNP. $m\angle J = 48^\circ$ and $m\angle K = 67^\circ$. Find $m\angle N$.

ANSWER _____

- 6** Quadrilateral ABCD is similar to quadrilateral EFGH. AB = 11, EF = 22, CD = 16, and GH = x. Find x.

ANSWER _____

APPLY IT Show your work

- 1** A video game map uses a scale of 1 cm to 4 m. A path on the map measures 7.5 cm. How long is the actual path?

WORK SPACE

ANSWER _____

- 2** A triangular logo for a streaming-channel banner is enlarged. The small logo has a base of 8 cm and a height of 5 cm. The enlarged logo has a base of 24 cm. What is its height?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Quadrilateral ABCD has side lengths 9, 12, 15, and 18. Quadrilateral WXYZ has matching side lengths 15, 20, 25, and 30. Can you conclude that the quadrilaterals are similar? Explain your reasoning.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	In triangles ABC and DEF, angle A and angle D have one arc marking, angle B and angle E have two arc markings, and angle C and angle F have three arc markings. Name all pairs of corresponding sides.	AB corresponds to DE; BC corresponds to EF; AC corresponds to DF.
2	Quadrilateral PQRS is similar to quadrilateral WXYZ. Write a proportion that compares all corresponding side lengths.	$PQ/WX = QR/XY = RS/YZ = PS/WZ$
3	Triangle LMN is similar to triangle RST. $LM = 9$, $RS = 15$, $MN = 12$, and $ST = x$. Find x .	$x = 20$
4	Triangle X has side lengths 6, 10, and 14. Triangle Y has matching side lengths 9, 15, and 21. Are the triangles similar? State the scale factor from X to Y.	Yes; the scale factor from X to Y is 1.5.
5	Triangle JKL is similar to triangle MNP. $m\angle J = 48^\circ$ and $m\angle K = 67^\circ$. Find $m\angle N$.	67°
6	Quadrilateral ABCD is similar to quadrilateral EFGH. $AB = 11$, $EF = 22$, $CD = 16$, and $GH = x$. Find x .	$x = 32$

PART 2 • APPLY IT

- 30 m** Multiply the map length by the scale: $7.5 \times 4 = 30$. The actual path is 30 m long.
- 15 cm** The scale factor is $24/8 = 3$. Multiply the original height by 3: $5 \times 3 = 15$ cm.

CHALLENGE

No. Each pair of matching sides has a ratio of 3/5, but proportional side lengths alone do not prove that quadrilaterals are similar. Corresponding angles must also be congruent.

Accept equivalent proportions that keep corresponding sides matched. For the challenge, accept explanations stating that proportional side lengths alone are not sufficient to prove quadrilateral similarity.