

Scale It Up

Use matching sides to find missing lengths in similar figures.

GRADE 7 • 7.MG.2.f

7.MG.2.f "Solve a proportion to determine a missing side length of similar quadrilaterals or triangles."

NAME _____

DATE _____

MATCH, THEN SCALE

Similar figures have matching angles and side lengths that are all multiplied by the same scale factor. Match corresponding vertices in order, write a proportion using matching sides, and solve for x .

WORKED EXAMPLE

Triangle ABC is similar to triangle DEF. $AB = 3$, $DE = 9$, $BC = 5$, and $EF = x$. Find x .

1. AB matches DE, and BC matches EF.
2. $3/9 = 5/x$
3. $3x = 45$
4. $x = 15$

Answer: $x = 15$

PRACTICE 6 problems

- 1** Triangle ABC is similar to triangle DEF. $AB = 4$, $DE = 12$, $BC = 7$, and $EF = x$. Find x .

ANSWER _____

- 2** Quadrilateral WXYZ is similar to quadrilateral JKLM. $WX = 6$, $JK = 18$, $XY = 8$, and $KL = x$. Find x .

ANSWER _____

- 3** Triangle PQR is similar to triangle STU. $PQ = 10$, $ST = 4$, $QR = x$, and $TU = 14$. Find x .

ANSWER _____

- 4** Quadrilateral ABCD is similar to quadrilateral EFGH. $AB = 16$, $EF = 8$, $CD = 22$, and $GH = x$. Find x .

ANSWER _____

- 5** Triangle GHI is similar to triangle JKL. $GH = 14$, $JK = 21$, $HI = 12$, and $KL = x$. Find x .

ANSWER _____

- 6** Quadrilateral MNOP is similar to quadrilateral QRST. $MN = 25$, $QR = 20$, $OP = x$, and $ST = 28$. Find x .

ANSWER _____

APPLY IT Show your work

- 1** A music club makes two similar triangular stage signs. A small sign has a base of 12 in and a matching side of 18 in. The large sign has a matching base of 20 in. How long is the matching side of the large sign?

WORK SPACE

ANSWER _____

- 2** A video game club prints a large version of a rectangular tournament map. The small map is 7 cm wide and 4 cm tall. The large map is 21 cm wide. If the maps are similar, how tall is the large map?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Triangle ABC is similar to triangle DEF. The side lengths of triangle ABC are 8, 11, and 13. The matching side lengths of triangle DEF are 12, x , and y . Find $x + y$.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Triangle ABC is similar to triangle DEF. $AB = 4$, $DE = 12$, $BC = 7$, and $EF = x$. Find x .	$x = 21$
2	Quadrilateral WXYZ is similar to quadrilateral JKLM. $WX = 6$, $JK = 18$, $XY = 8$, and $KL = x$. Find x .	$x = 24$
3	Triangle PQR is similar to triangle STU. $PQ = 10$, $ST = 4$, $QR = x$, and $TU = 14$. Find x .	$x = 35$
4	Quadrilateral ABCD is similar to quadrilateral EFGH. $AB = 16$, $EF = 8$, $CD = 22$, and $GH = x$. Find x .	$x = 11$
5	Triangle GHI is similar to triangle JKL. $GH = 14$, $JK = 21$, $HI = 12$, and $KL = x$. Find x .	$x = 18$
6	Quadrilateral MNOP is similar to quadrilateral QRST. $MN = 25$, $QR = 20$, $OP = x$, and $ST = 28$. Find x .	$x = 35$

PART 2 • APPLY IT

- 30 in** Use the scale factor from the small base to the large base: $20/12 = 5/3$. Multiply 18 by $5/3$ to get 30 in.
- 12 cm** The width is multiplied by $21/7$, or 3. Multiply the small height, 4 cm, by 3 to get 12 cm.

CHALLENGE

$$x + y = 36$$

Accept any correct proportion that compares corresponding sides in the same order. Accept equivalent fraction work and correct answers with or without units when the unit is clear from the problem.