

Scale It Up

Practice similar figures, scale drawings, and pi.

GRADE 7 • TEKS 7.5

7.5 "Proportionality. The student applies mathematical process standards to use geometry to describe or solve problems involving proportional relationships. The student is expected to: generalize the critical attributes of similarity..."

NAME _____

DATE _____

SCALE FACTOR MOVES

Similar figures have matching angles and corresponding side lengths that are multiplied by the same scale factor. You can divide matching lengths to find the scale factor, then multiply to find a missing length. For every circle, pi is the circumference divided by the diameter, so $C = \pi \times d$.

WORKED EXAMPLE

Rectangle A has side lengths 7 units and 5 units. A similar Rectangle B has a side matching the 7-unit side that measures 21 units. Find the side of Rectangle B that matches the 5-unit side.

1. Find the scale factor: $21 / 7 = 3$.

2. Multiply the matching side: $5 \times 3 = 15$.

Answer: 15 units

PRACTICE 6 problems

- 1** Triangle A has corresponding side lengths 4 units and 10 units. Similar Triangle B has a side matching the 4-unit side that is 8 units long. Find x, the side of Triangle B that matches the 10-unit side.

ANSWER _____

- 2** A scale drawing uses 1 cm to represent 25 m. A real trail is 200 m long. How long is the trail on the drawing?

ANSWER _____

- 3** A rectangle is 12 units by 16 units. A similar drawing is made with a scale factor of $1/2$. What is the perimeter of the drawing?

ANSWER _____

- 4** Figure A has corresponding sides of 11 units and 13 units. Figure B has matching sides of 22 units and 26 units. What scale factor maps Figure A to Figure B?

ANSWER _____

- 5** A circle has a circumference of 31.4 cm and a diameter of 10 cm. Use circumference / diameter to find pi for this circle.

ANSWER _____

- 6** Use $\pi = 3.14$. What is the circumference of a circle with a diameter of 18 cm?

ANSWER _____

APPLY IT Show your work

- 1** A video game map uses a scale of 1 cm for 24 m. A parkour route in the game is 180 m long. How many centimeters long should the route be on the map?

WORK SPACE

ANSWER _____

- 2** A hoodie logo uses two similar triangles. On the smaller triangle, one side is 8 cm and another side is 18 cm. On the larger triangle, the side matching 8 cm is 12 cm. How long is the side matching 18 cm?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A small rectangle has one side of 8 cm and a perimeter of 28 cm. A similar larger rectangle has a perimeter of 56 cm. Find the dimensions of the larger rectangle and explain your reasoning.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Triangle A has corresponding side lengths 4 units and 10 units. Similar Triangle B has a side matching the 4-unit side that is 8 units long. Find x, the side of Triangle B that matches the 10-unit side.	20 units
2	A scale drawing uses 1 cm to represent 25 m. A real trail is 200 m long. How long is the trail on the drawing?	8 cm
3	A rectangle is 12 units by 16 units. A similar drawing is made with a scale factor of $\frac{1}{2}$. What is the perimeter of the drawing?	28 units
4	Figure A has corresponding sides of 11 units and 13 units. Figure B has matching sides of 22 units and 26 units. What scale factor maps Figure A to Figure B?	2
5	A circle has a circumference of 31.4 cm and a diameter of 10 cm. Use circumference / diameter to find pi for this circle.	3.14
6	Use $\pi = 3.14$. What is the circumference of a circle with a diameter of 18 cm?	56.52 cm

PART 2 • APPLY IT

- 7.5 cm** Divide the actual distance by the number of meters represented by each centimeter: $180 / 24 = 7.5$.
- 27 cm** The scale factor is $12 / 8 = 1.5$. Multiply 18 by 1.5 to get 27.

CHALLENGE

16 cm by 12 cm. The small rectangle is 8 cm by 6 cm, and the perimeter doubles from 28 cm to 56 cm, so each side length doubles.

Accept equivalent ratio work and correct units where appropriate. For circle problems, use $\pi = 3.14$ as stated.