

Scale It Up

Use scale factors to find new dimensions and areas.

GRADE 7 • MA.7.GR.1.5

MA.7.GR.1.5 "Solve mathematical and real-world problems involving dimensions and areas of geometric figures, including scale drawings and scale factors."

NAME _____

DATE _____

AREA CHANGES FASTER

When a figure is scaled, multiply every length by the scale factor. Area changes by the scale factor multiplied by itself. For a drawing scale, first use the scale to find actual lengths, then find the area.

WORKED EXAMPLE

A 5 cm by 7 cm rectangle is enlarged by a scale factor of 3. Find its new area.

1. Original area = $5 \times 7 = 35 \text{ cm}^2$.
2. New side lengths are $5 \times 3 = 15 \text{ cm}$ and $7 \times 3 = 21 \text{ cm}$.
3. New area = $15 \times 21 = 315 \text{ cm}^2$.

Answer: 315 cm^2

PRACTICE 6 problems

- 1** A rectangle measures 8 cm by 6 cm. It is enlarged by a scale factor of 4. What are the new dimensions and area?

ANSWER _____

- 2** A figure has an area of 18 cm^2 . A copy is made with a scale factor of $1/2$. What is the area of the copy?

ANSWER _____

- 3** On a scale drawing, 1 cm represents 12 m. A rectangular garden measures 11 cm by 6 cm on the drawing. What is the actual area of the garden?

ANSWER _____

- 4** A right triangle has legs of 20 cm and 16 cm. A reduced copy has a scale factor of $1/2$. What is the area of the reduced triangle?

ANSWER _____

- 5** A rectangle is 8 cm by 9 cm. Its enlargement has an area of $1,152 \text{ cm}^2$. What is the scale factor?

ANSWER _____

- 6** A circle has a radius of 8 cm. It is reduced by a scale factor of $1/4$. What is the area of the reduced circle in terms of pi?

ANSWER _____

APPLY IT Show your work

- 1** A music club makes a scale drawing for a rectangular practice stage. On the drawing, 1 cm represents 8 m, and the stage measures 11 cm by 6 cm. What is the actual area of the stage?

WORK SPACE

ANSWER _____

- 2** A content creator has a rectangular thumbnail design that is 18 in. by 14 in. A festival banner uses the design with a scale factor of 2. How much fabric is needed to cover the front of the banner?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

An L-shaped park is made from a 20 m by 16 m rectangle with an 8 m by 4 m corner cut out. A map uses the scale 1 cm = 2 m. What is the area of the L-shaped park on the map?

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A rectangle measures 8 cm by 6 cm. It is enlarged by a scale factor of 4. What are the new dimensions and area?	32 cm by 24 cm; 768 cm²
2	A figure has an area of 18 cm ² . A copy is made with a scale factor of 1/2. What is the area of the copy?	9/2 cm²
3	On a scale drawing, 1 cm represents 12 m. A rectangular garden measures 11 cm by 6 cm on the drawing. What is the actual area of the garden?	9,504 m²
4	A right triangle has legs of 20 cm and 16 cm. A reduced copy has a scale factor of 1/2. What is the area of the reduced triangle?	40 cm²
5	A rectangle is 8 cm by 9 cm. Its enlargement has an area of 1,152 cm ² . What is the scale factor?	4
6	A circle has a radius of 8 cm. It is reduced by a scale factor of 1/4. What is the area of the reduced circle in terms of pi?	4pi cm²

PART 2 • APPLY IT

- 4,224 m²** The actual dimensions are 88 m and 48 m. Multiply 88 x 48 to find the area.
- 1,008 in.²** The banner dimensions are 36 in. by 28 in. Multiply 36 x 28.

CHALLENGE

72 cm²

Accept equivalent area forms, including $4\frac{1}{2}$ cm² for $\frac{9}{2}$ cm². For the challenge, accept work that finds the scaled outer rectangle and scaled cutout before subtracting.