

Similar shapes



Identify similar and congruent shapes, and use scale factors to find missing dimensions.

Name _____

Date _____

How to solve these problems

Decide whether shapes are similar by checking if corresponding angles are equal and sides are in proportion. When shapes are similar, use the scale factor (ratio of corresponding sides) to find missing dimensions. Show your reasoning clearly.

Worked example Triangle A has sides 3, 4, 5. Triangle B has sides 6, 8, 10. Are they similar?

Check each ratio: $\frac{6}{3} = 2$, $\frac{8}{4} = 2$, $\frac{10}{5} = 2$.

All ratios equal 2, so the shapes are similar with scale factor 2.

1. Rectangle A is $2 \text{ cm} \times 5 \text{ cm}$. Rectangle B is $4 \text{ cm} \times 10 \text{ cm}$. Are they similar?

2. A side grows from 4 cm to 8 cm. Find the scale factor.

3. A side shrinks from 12 cm to 6 cm. Find the scale factor.

4. A triangle is enlarged by scale factor 2. A side was 5 cm. Find the new side length.

5. A shape is enlarged by scale factor $\frac{1}{2}$. A side was 10 cm. Find the new side length.

6. A small square has side 3 cm. A similar larger square has side 9 cm. Find the scale factor.

7. Triangle A has sides 2, 3, 4. Triangle B has sides 4, 6, 8. Are they similar?

8. Triangle A has sides 4, 5, 6. Triangle B has sides 8, 10, 14. Are they similar?

9. A similar shape has scale factor 4. The original side is 2.5 cm. Find the new side.

10. A similar shape has scale factor $\frac{1}{3}$. The original side is 18 cm. Find the new side.

11. A rectangle 3 by 7 is enlarged by factor 2. Write the new dimensions.

12. A triangle side goes from 9 cm to 27 cm. Find the scale factor.

Similar shapes (continued)



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13. A side goes from 20 cm to 4 cm. Find the scale factor.

14. Two polygons have matching side lengths 5 and 15. What is the enlargement factor?

15. A larger similar triangle has side 24 cm. The scale factor from small to large is 3. Find the small side.

16. A larger similar rectangle has side 14 cm. The scale factor from small to large is 2. Find the small side.

17. A smaller similar shape has side 6 cm. The scale factor from large to small is $\frac{1}{2}$. Find the large side.

18. Triangles with sides 3, 5, 7 and 6, 10, 14: similar or not?

19. Rectangles 4×9 and 8×18 : similar or not?

20. Do similar shapes always have equal angles? Explain briefly.

21. Rectangle A is $3 \text{ cm} \times 5 \text{ cm}$. Rectangle B is $6 \text{ cm} \times 8 \text{ cm}$. Are they similar?

22. A side grows from 7 cm to 21 cm. Find the scale factor.

23. A rectangle is enlarged by scale factor 3. A side was 4 cm. Find the new side length.

24. A small triangle has side 8 cm. A similar larger triangle has side 12 cm. Find the scale factor.

25. Scale factor 2 is applied to a shape. Is the area also scaled by 2? Explain.

26. If two shapes are congruent, what is the scale factor between them?

27. A shape is reduced by scale factor $\frac{1}{4}$. A side was 20 cm. Find the new side.
