MATHEMATICS · GRADES 7-9

Congruent Figures

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you tell whether two shapes are exactly the same size and shape. Matching floor tiles or two identical keys cut from the same blank are congruent, because one fits exactly on top of the other. It is the idea behind manufacturing and construction, where parts have to be identical to fit together.



Rule

Congruent figures: two figures are congruent if they are exactly the same size and shape, so one fits exactly on top of the other.

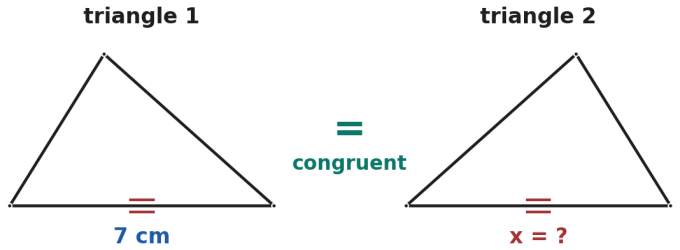
Matching sides in congruent figures are equal, and matching angles are equal. Find the matching side or angle, then use its measure.

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Worked examples

EXAMPLE 1

Q Two triangles are congruent. One side is 7 cm. What is the matching side in the other?



SOLUTION

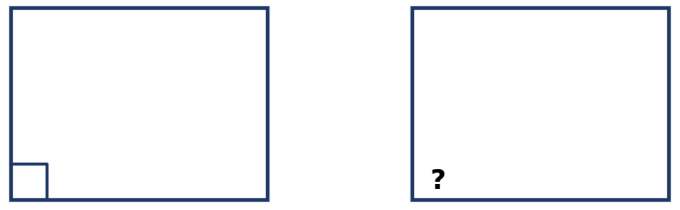
Congruent means exactly the same size and shape.

Sides that match up in congruent figures have the same length.

The matching side is 7 cm.

EXAMPLE 2

Q Two rectangles are congruent. One angle is 90 degrees. What is the matching angle?



SOLUTION

Congruent means exactly the same size and shape.

Angles that match up in congruent figures have the same size.

The matching angle is 90 degrees.

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Practice questions

1. Two triangles are congruent. One side is 9 cm. What is the matching side in the other triangle?

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2. Two rectangles are congruent. One angle is 75 degrees. What is the matching angle in the other rectangle?

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3. Two congruent triangles have sides 5 cm, 7 cm and 9 cm. What is the longest side of the other triangle?

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4 Two congruent triangles have angles 40° and 75°. What is the third angle in the other triangle?

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5 Two congruent rectangles have length 8 cm and width 5 cm. What is the perimeter of the other rectangle?

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6 Two congruent triangles have sides of 10 cm, 6 cm and 8 cm. What is the perimeter of the other triangle?

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7 Two congruent rectangles have width 3 cm and length 9 cm. What is the area of the other rectangle?

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8 A triangle has angles 65°, 60° and 55°. Its congruent partner has one angle marked 60°. What are the other two angles of the partner?

A 65° and 55°

B 60° and 55°

C 65° and 60°

D 55° and 55°

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9 Two squares have sides 4 cm and 5 cm. Are they congruent? Answer yes or no.

A Yes

B No

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10 Two triangles have the same shape, but one is twice as big as the other. Are they congruent? Answer yes or no.

A Yes

B No

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ANSWER KEY

1. 9 cm

2. 75 degrees

3. 9 cm

4. 65 degrees

5. 26 cm

6. 24 cm

7. 27 cm^2

8. 65° and 55°

9. No

10. No

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