

# Congruent

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Name: \_\_\_\_\_

Date: \_\_\_\_\_

## At a glance

Congruent shapes, the four triangle conditions and using them to find lengths and angles.

1. What congruent means
2. The four conditions
3. Using congruence

## 1. What congruent means

☐ I revised this

- Congruent shapes are **identical in shape and size**. They may be rotated or reflected.
- Corresponding sides are equal and corresponding angles are equal.
- Similar shapes have equal angles but sides in proportion — different sizes are allowed.

### Worked example

Two triangles have the same three angles but different sides. Are they congruent?

1. Same angles only shows they are similar.

**No — they are similar, not necessarily congruent**

## 2. The four conditions

☐ I revised this

- Two triangles are congruent if they match on one of these:

| Condition    | What must be equal                         |
|--------------|--------------------------------------------|
| SSS          | all three sides                            |
| SAS          | two sides and the angle BETWEEN them       |
| ASA (or AAS) | two angles and a corresponding side        |
| RHS          | right angle, hypotenuse and one other side |

### Worked example

Triangles have  $AB = DE$ , angle  $B = \text{angle } E$  and  $BC = EF$ . Are they congruent? Which condition?

1. Two sides equal; the equal angle is between them.

**Yes, SAS**

## 3. Using congruence

☐ I revised this

- Match the vertices in order:  $ABC \cong PQR$  means  $A \leftrightarrow P$ ,  $B \leftrightarrow Q$ ,  $C \leftrightarrow R$ .
- Then the side  $AB = PQ$ ,  $BC = QR$ , angle  $B = \text{angle } Q$ , and so on.
- AAA and SSA do **not** prove congruence.

### Worked example

$ABC \cong PQR$ .  $AB = 7 \text{ cm}$ ,  $BC = 9 \text{ cm}$ , angle  $B = 48^\circ$ . Find  $QR$  and angle  $Q$ .

1.  $BC \leftrightarrow QR$ .
2. Angle  $B \leftrightarrow \text{angle } Q$ .

**$QR = 9 \text{ cm}$ , angle  $Q = 48^\circ$**

## Common mistakes

| Don't write                                    | Write instead                             |
|------------------------------------------------|-------------------------------------------|
| ✗ Using AAA to show congruence                 | ✓ AAA shows similarity only               |
| ✗ Matching sides by their position on the page | ✓ Match by letter order or equal angles   |
| ✗ Calling any two sides and an angle SAS       | ✓ The angle must be between the two sides |

## In the exam

- Name the condition (SSS, SAS, ASA, RHS) in your answer.
- Redraw the triangles the same way round if they are turned or flipped.
- Mark equal sides and angles on the diagram first.

## My notes

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