



TRIANGLE CONGRUENCE USING **SSS** AND **SAS**

Unit 4 Lesson 2

TRIANGLE CONGRUENCE USING SSS AND SAS

Students will be able to:

identify the congruent triangles using SSS (Side-Side-Side) and SAS (Side-Angle-Side) postulates.

Key Vocabulary

- **Congruent triangles**
- **Side-Side-Side Postulate**
- **Side-Angle-Side Postulate**

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Congruent triangles

Two triangles are congruent if they have same shape and the same size.

- The corresponding angles of the congruent figures are equal in measures.
- The corresponding sides of the congruent shapes are equal.

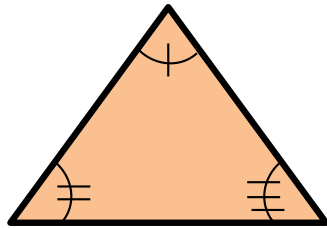


Figure 1

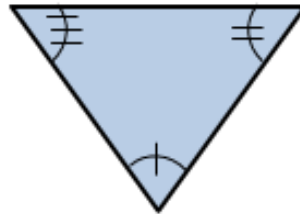


Figure 2

The **figure 1** and **figure 2** are congruent since both shapes are triangles and their size is same.

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How to show congruence of two triangles

Suppose you want to see whether two triangles are congruent or not. What information you need? What properties of triangles you can use to show that two triangles are congruent?

The two properties of a triangle are:

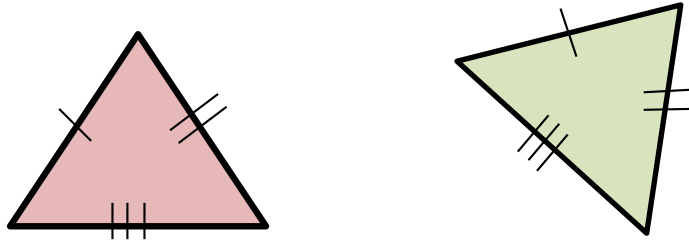
- **3 Sides**
- **3 Angles**

We can use these properties (any valid combination of these properties) to show whether two triangles are congruent or not.

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The Side-Side-Side Postulate (SSS)

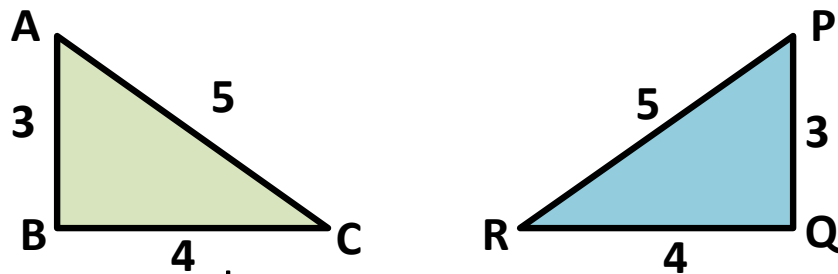
If all the three sides of one triangle are congruent (equal in measures) to all the corresponding three sides of another triangle, then the two triangles are said to be congruent.



The two triangles shown are congruent by SSS postulate since all the sides of one triangle are congruent to the corresponding three sides of the other triangle.

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Example 1: Show that the two triangles given below are congruent.



From the figure, we see that:

$$AB \cong PQ = 3$$

$$AC \cong PR = 5$$

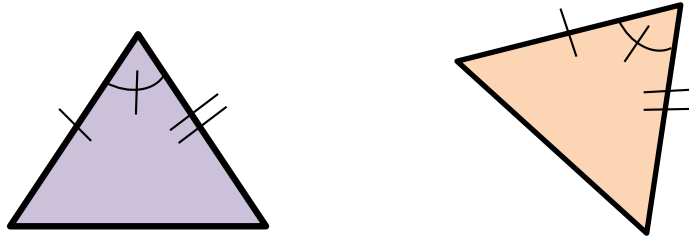
$$BC \cong QR = 4$$

Since three sides of $\triangle ABC$ are congruent to corresponding three sides of $\triangle PQR$,
so by SSS postulate: $\triangle ABC \cong \triangle PQR$

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The Side-Angle-Side Postulate (SAS)

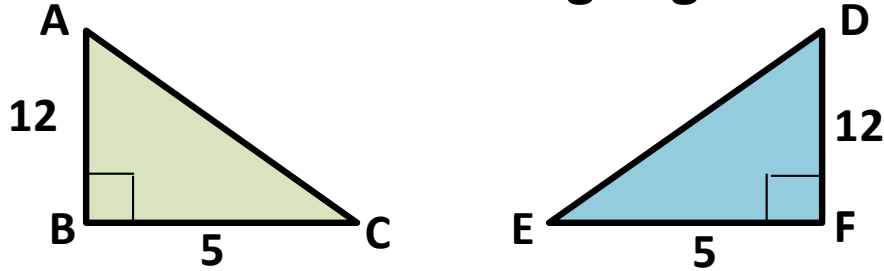
If two sides and their included angle of one triangle is congruent to the two sides and their included angle of another triangle, the two triangles are said to be congruent.



The two triangles shown are congruent by SAS postulate since the two sides and their included angle of one triangle is congruent to the two sides and their included angle of the other triangle.

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Example 2: Show that the two triangles given below are congruent.



From the figure, we see that:

$$AB \cong DF = 12$$

$$BC \cong FE = 5$$

$$\angle B \cong \angle F = 90^\circ$$

Since two sides and their included angle of $\triangle ABC$ is congruent to the two sides and their included angle of $\triangle DEF$, so by SAS postulate:

$$\triangle ABC \cong \triangle DEF$$