CONGRUENT TRIANGLES

If Triangle ABC (ΔABC) is congruent to Triangle FDE (ΔFDE), we write ΔABC ≡ ΔFDE. This is called a congruence statement.
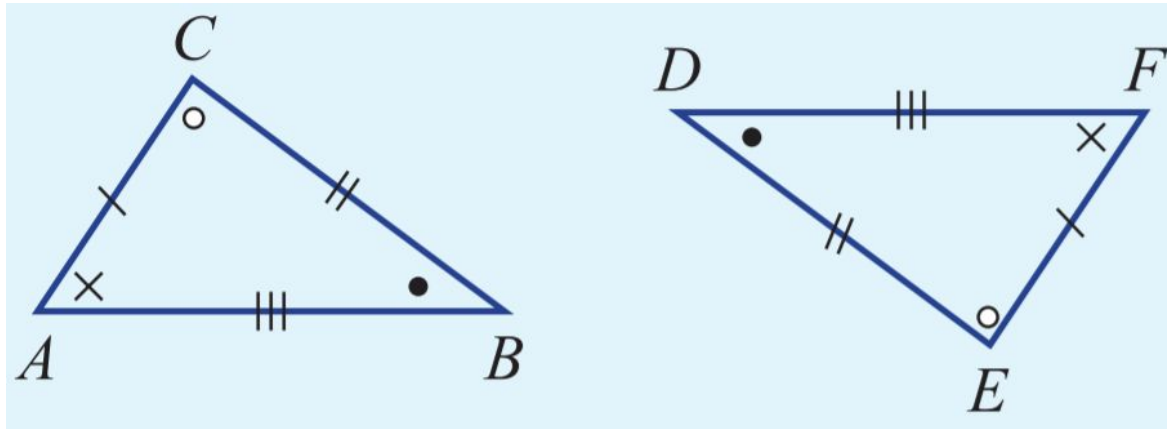
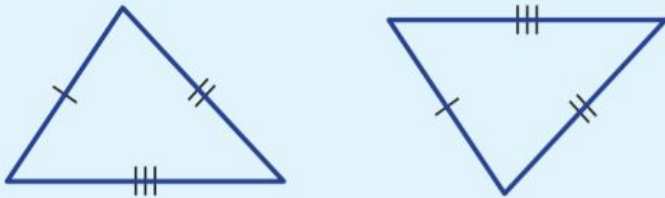| Matching sides	Matching angles
$AB = FD$	$\angle A = \angle F$
$BC = DE$	$\angle B = \angle D$
$AC = FE$	$\angle C = \angle E$

Matching sides are opposite equal matching angles.
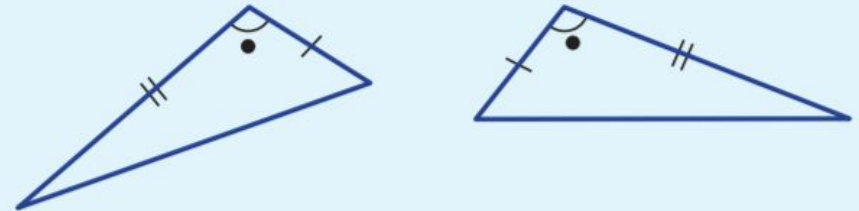
FOUR TESTS FOR TRIANGLE CONGRUENCE

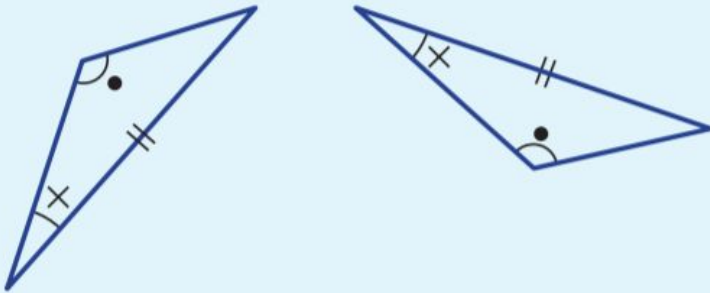– Side, Side, Side (SSS)
Three pairs of matching sides are equal.

– Side, Angle, Side (SAS)
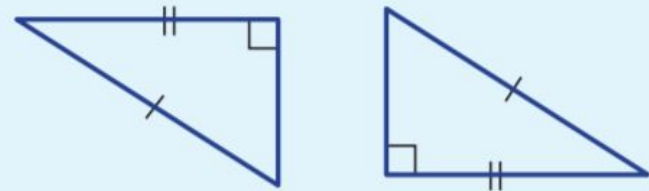Two pairs of matching sides and the included angle are equal.

– Angle, Angle, Side (AAS)
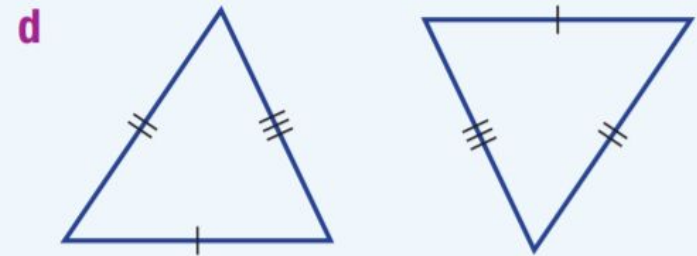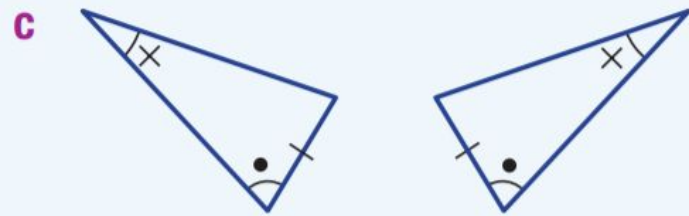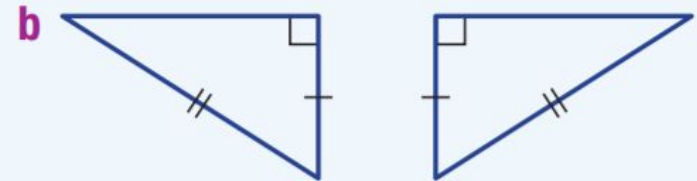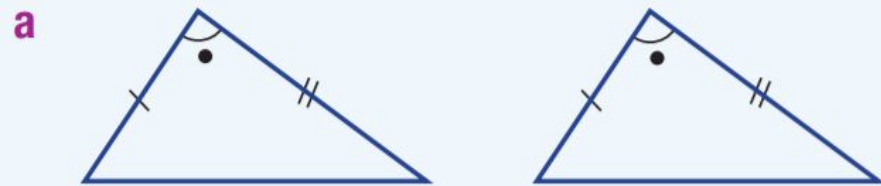Two angles and any pair of matching sides are equal.

– Right angle, Hypotenuse, Side (RHS)
A right angle, the hypotenuse and one other pair of matching sides are equal.

FOUR TESTS FOR TRIANGLE CONGRUENCE

Which congruence test (SSS, SAS, AAS or RHS) would be used to show that these pairs of triangles are congruent?

SOLUTION | **EXPLANATION**

|		
a	SAS	Two pairs of matching sides and the included angle are equal.
b	RHS	A right angle, hypotenuse and one pair of matching sides are equal.
c	AAS	Two angles and a pair of matching sides are equal.
d	SSS	Three pairs of matching sides are equal.

FOUR TESTS FOR TRIANGLE CONGRUENCE

Which of the tests (SSS, SAS, AAS or RHS) would you choose to test the congruence of these pairs of triangles?

a

b
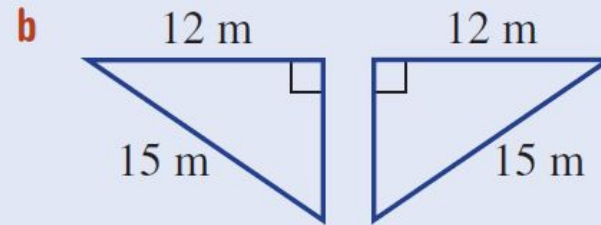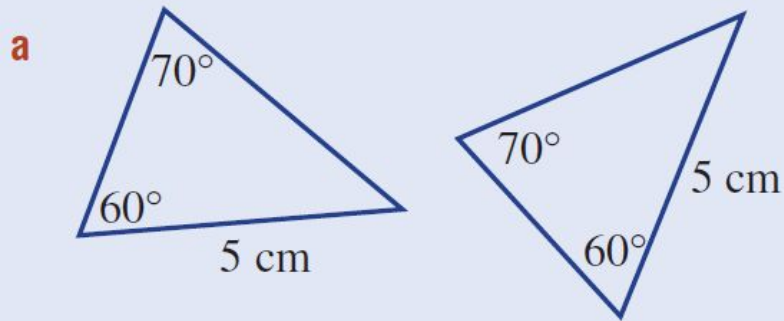
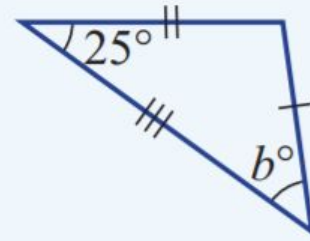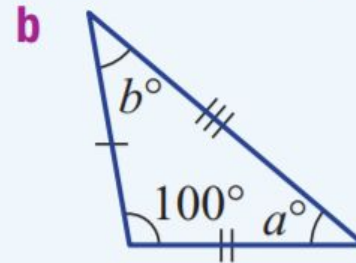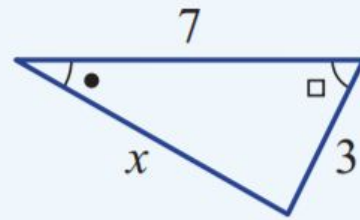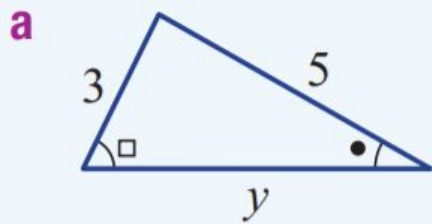| SOLUTION		EXPLANATION
a	AAS	There are two equal angles and one pair of equal corresponding sides. The side that is 5 cm is adjacent to the 60° angle on both triangles.
b	RHS	There is a pair of right angles with equal hypotenuse lengths. A second pair of corresponding sides are also of equal length.

FOUR TESTS FOR TRIANGLE CONGRUENCE

Find the values of the pronumerals in these pairs of congruent triangles.

SOLUTION

a $x = 5$

$y = 7$

b $a = 25$

$b = 180 - 100 - 25$

$\quad = 55$

EXPLANATION

The side of length x and the side of length 5 are in matching positions (opposite the □).

The longest side on both triangles must be equal.

The angle marked $a°$ matches the 25° angle in the other triangle.

The sum of three angles in a triangle is 180°.