How Many Solutions?

1. SSS (side-side-side)

Suppose we are given the lengths of the sides a, b, c.
Suppose also that a is the longest side, i.e., $a > b$ and $a > c$. Then

# Solutions	0	1
	if $a \geq b+c$	otherwise

no matter
where $b+c$ are placed
we cannot form a triangle

2. ASA (angle-side-angle)

Suppose we are given the values of a, B, C. Then

# Solutions	0	1
	if $B+C \geq 180°$	otherwise

3. SAS (side-angle-side)

Suppose we are given the values of A, b, c. Then

# Solutions	0	1
	if $A \geq 180°$	otherwise

4. SSA (side-side-angle)

Suppose we are given the values of A, b, a. Then

If $A \geq 90°$:

# Solutions	0	1
	if $a \leq b$	otherwise

If $A < 90°$:

# Solutions	0	1	2
	if $a < b\sin A$	if $a = b\sin A$ OR $a \geq b$	if $b\sin A < a < b$

see "SSA triangles"
document
for explanation

5. AAS (angle-angle-side)

Suppose we are given the values of A, B, a. Then

# Solutions	0	1
	if $B+C \geq 180°$	otherwise

We can immediately
find the value of
C ($= 180 - A - B$),
so this reduces to
the ASA case