

Substitution Property of Equality

Examples & Non-Examples

Example	Example	Non-Example
Given: $\angle A \cong \angle B$ and $m\angle B = 60^\circ$ Then by substitution: Since $m\angle A = m\angle B$, we can substitute and say: $m\angle A = 60^\circ$	Given: $AB = CD$ and $CD = 12$ Then: $AB = 12$ (by substitution)	Given: $AB = CD$ and $CD = EF$ Then concluding: $AB = EF$ This is not substitution — it's the transitive property of equality , because you're connecting three equal quantities rather than replacing one value with another in an expression or equation.

Definition

The **Substitution Property of Equality** in Geometry states:

“If two values are equal, then one can be substituted for the other in any expression or equation.”

In other words:

If $a = b$, then you can replace a with b (or vice versa) in any mathematical statement without changing its truth.

Example:

If you know that

$$x = 5$$

and

$$y = x + 3,$$

then you can **substitute** 5 for x and write:

$$y = 5 + 3 = 8$$

Why it matters in Geometry:

The Substitution Property helps when working with **congruent segments or angles**. If you know two things are equal (or congruent), you can swap them in a proof or calculation.

