Example 7 : What is the properties of the relation =?

1) $a=a$ for any element $a \in A$, so = is reflexive
2) If $a = b$ then $b = a$, so = is symmetric
3) If $a = b$ and $b = c$ then $a = c$, so = is transitive
4) = is (reflexive + symmetric + transitive), so = is equivalence
5) $a = a$, so = is not Irreflexive
6) If $a = b$ and $b = a$ then $a = b$, so = is anti-symmetric

Remark: The properties of being symmetric and being antisymmetric are notnegatives of each other· For example, the relation $R = \{(1, 3), (3, 1), (2, 3)\}$ is neither symmetric nor antisymmetric· On the other hand, the relation $R = \{(1, 1), (2, 2)\}$ isboth symmetric and antisymmetric