**Name and student number:**

1. Let $A = \{a, b, c\}$ and let $R = \{(a, a), (a, c), (b, b), (b, c), (c, a), (c, b)\}$ define a relation on $A$. Determine whether the following statements are true or false. Explain your answer.

[1] (a) For each $x \in A$, $x \, R \, x$.

[2] (b) For every $x, y \in A$, if $x \, R \, y$, then $y \, R \, x$.

[2] (c) For every $x, y, z \in A$, if $x \, R \, y$ and $y \, R \, z$, then $x \, R \, z$.

[1] (d) The relation $R$ defines a function from $A$ to $A$.

Total: 10 points

2. Let $A = \{a, b\}$, and consider the relations $R_1 = \{(a, a), (b, b)\}$ and $R_2 = \{(a, a), (a, b)\}$.
[4] Show that $R_1$ is an equivalence relation but $R_2$ is not. Is $R_2$ transitive?