This quiz is over Homework Set Eight. Please complete the problems below in full detail and work independently. Good luck!

Problem 1 (4 points): Let \( R \) be the relation defined on \( \mathbb{Z} \) by \( a \, R \, b \) if \( a + b \equiv 0 \pmod{3} \). Show that \( R \) is not an equivalence relation.

Consider \( a = 1 \). Then \( a + a = 1 + 1 = 2 \not\equiv 0 \pmod{3} \).

Thus \( 1 \not\epsilon R \). Hence \( R \) is not reflexive.

\therefore \( R \) is not an eq. relation.

Problem 2 (6 points): For sets \( A = \{1, 2, 3, 4\} \) and \( B = \{x, y, z\} \), give an example of a function \( g \in B^A \) and a function \( h \in B^B \).

Consider the following functions:
\[
g = \{(1, x), (2, y), (3, z), (4, x)\}
\]
\[
h = \{(x, x), (y, y), (z, z)\}
\]
Notice that \( g \) and \( h \) are in fact functions since every element maps to one other element.