Quiz 4

TRUE/FALSE: Write "True" in each of the following cases if the statement is *always* true and briefly justify your answer. Otherwise, write"False" and provide brief reasoning.

1. [2] (HW6 §4.1 #2) Let a, b, & c be positive integers & $a \neq 0$. If $a|(bc)$ then $a|b$ or $a|c$.

2. [2] (§9.1 #3d) The relation on the set $\{1, 2, 3, 4\}$ defined by $\{(1, 2), (2, 1), (2, 3), (3, 4)\}$ is antisymmetric.

3. [2] (Relations Wks #2) The relation on the set $\{1, 2, 3, 4\}$ defined by $\{(a, b) | \max(a, b) = b\}$ is reflexive.

4. [3] (§9.5 #13) The relation on the set of all bit strings of length 3 or more defined by $\{(a, b) |$ the 1st and 3rd bits agree$\}$ is an equivalence relation.

Free Response: Show your work! No credit is given without supporting work.

5. Let R_{12} be a relation on $\mathbb{Z}$ defined as $\{(a, b)|a \equiv b \mod 12\}$

   (a) [3] (HW6 §9.5 #1) Identify three numbers in the equivalency class of 4.

   (b) [2] (Mod Wks) Compute $4 \mod 12 + 11 \mod 12$

   (c) [3] (HW6 §9.1 #2) Identify three numbers in the set $R_{12} \circ R_{12}$.

   (d) [3] Prove the equivalency class of $4 \mod 12$ intersected with the equivalency class of $0 \mod 12$ is empty.