CSCI 301, Math Exercises #3

YOUR NAME HERE

Due date: Tuesday, May 1, midnight.

1. Consider the relation $|$ (divides) on the set $\mathbb{Z}$.
   (a) Prove or disprove: $|$ is reflexive.
   (b) Prove or disprove: $|$ is symmetric.
   (c) Prove or disprove: $|$ is transitive.
2. Assume R and S are two equivalence relations on a set A.
   (a) Prove or disprove: $R \cup S$ is reflexive.
   (b) Prove or disprove: $R \cup S$ is symmetric.
   (c) Prove or disprove: $R \cup S$ is transitive.
3. Consider the function $\theta : \{0, 1\} \times \mathbb{N} \to \mathbb{Z}$ defined as $\theta(a, b) = a - 2ab + b$
   (a) Prove or disprove: θ is injective.
   (b) Prove or disprove: θ is surjective.