MAT-CSC A67: Discrete Mathematics — Summer 2024

Quiz 7

Due Date: Friday, July 5, 11:59 PM, on Crowdmark

Q1. Find the Bezout Coefficients of 414 and 662.

Q2. Let a, b, d, and $n > 1$ be arbitrary integers. Prove that if $ad \equiv bd \pmod{n}$ and $\gcd(d, n) = 1$, then $a \equiv b \pmod{n}$.

Q3. Prove that the union of a countable number of countable sets is countable.

Q4. Let n be any arbitrary positive integer. Let $m_1, m_2, m_3, \ldots, m_n$ be pairwise relatively prime integers greater than or equal to 2. Prove that if $a \equiv b \pmod{m_i}$ for $i = 1, 2, \ldots, n$, then $a \equiv b \pmod{m_1 m_2 \ldots m_n}$.