CS113/DISCRETE MATHEMATICS-SPRING 2024

Worksheet 28

Topic: Divisibility and Modular Arithmetic

Get ready to learn modular arithmetic, where our primary focus revolves around remainders. This branch of mathematics holds immense significance in various fields, including computer science, cryptography, and number theory, rendering it indispensable in the modern world. Happy Learning!

Student's Name and ID: _____

Instructor's name: _____

1. **Show that if $a \mid b$ and $b \mid a$, where a and b are integers, then $a = b$ or $a = -b$.**

2. Show that if a, b, c, and d are integers, where $a \neq 0$, such that $a \mid c$ and $b \mid d$, then $ab \mid cd$.

3. **Statement:** If $a \mid bc$, where a, b, and c are positive integers and $a \neq 0$, then $a \mid b$ or $a \mid c$.

4. . Prove that if a and b are nonzero integers, a divides b, and a + b is odd, then a is odd.