Math 96:
Homework 2

Fall 2024

This homework is due in class on Friday, October 11th. Please complete at least one problem below.

1969 B1: Let n be a positive integer such that $n+1$ is divisible by 24. Prove that the sum of the divisors of n is divisible by 24.

2014 B3: Let A be an $m \times n$ matrix with rational entries. Suppose that there are at least $m+n$ distinct prime numbers among the absolute values of the entries of A. Show that the rank of A is at least 2.

1954 A7: Prove that there are no integers x and y for which

$$x^2 + 3xy - 2y^2 = 122.$$