

Homework 3 - Math 381 A - Autumn 2015 - Dr. Matthew Conroy

There are two problems below.

You need to do exactly one of them.

Look at your student id number.

If the right-most digit of your student id number is odd, do problem #1.

If the right-most digit of your student id number is even, do problem #2.

1. Define a graph $G = (V, E)$ as follows.

Let $V = \{1, 2, 3, 4, \dots, 20\}$. Define $E = \{(i, j) : i, j \in V, i < j, i + j \text{ is prime}\}$.

Write and solve an IP to find the chromaticity number of G , $\chi(G)$.

2. Define a graph $G = (V, E)$ as follows.

Let $V = \{2, 3, 4, \dots, 20\}$. Define $E = \{(i, j) : i, j \in V, i < j, ij + 1 \text{ is prime}\}$.

Write and solve an IP to find the chromaticity number of G , $\chi(G)$.

Be sure to give a complete explanation of your method of solution.

Explicitly list your objective function and all constraints in your IP.

Include all code you write to solve the problem, and all software output.

Note: Suppose a and b are positive integers.

We say that a is a *divisor* of b if $b = ak$ for some integer k .

A *prime* is an integer greater than 1 that has no divisors other than 1 and itself.

The sequence of primes begins 2, 3, 5, 7, 11,