

Full Name:
Student Number:

TOTAL POINTS: /10

Trent University MATH 2600 - Discrete Structures
Instructor: Aras Erzurumluoğlu

Assignment 5 (due 4:00 pm on Wednesday, April 8th, 2020)

READ ME: When attempting the problems you are allowed to consult your lecture notes, textbooks, the internet, etc. However, you are not allowed to copy each other's work (not even partially!).

You are expected to write your solutions in full detail and using a precise mathematical language. You will lose points for imprecise solutions.

Late assignments may not be accepted.

Problem 1) (1 point): What is the smallest number n such that if any n positive integers are chosen at random, at least 3 among them give the same remainder when divided by 11?

Problem 2) (2 points): What is the coefficient of $x^{13}y^{10}$ in the expansion of $(x - 3y)^{23}$?

Problem 3) (2 points): How many integer solutions are there to the equation $x_1 + x_2 + x_3 + x_4 + x_5 = 12$, where $x_1 \geq 4, x_2 \geq -3, x_3 \geq -1, x_4 \geq 0, x_5 \geq -1$?

Problem 4) (2 points): Define a graph G as follows:

- The vertex set of G is the set of all 3-element subsets of $S = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$. (For example, $\{1, 3, 7\}$ is a vertex of G .)
- Two vertices A and B are adjacent in G if and only if $|A \cap B| = 1$.

How many vertices are there in G ? How many edges are there in G ?

Problem 5) (1 point): How many integers between 358 and 843 are divisible by 5 or 7? (Note that "between" may or may not be inclusive of 358 and 843, it won't change the answer.)

Problem 6) (2 points): Does there exist a simple graph with degree sequence $(2, 2, 3, 3, 3, 3, 6, 6, 7, 9, 9)$?