

Graph Theory and Combinatorics MATH-42021/52021.

Home Work 8, due on Tuesday, July 12

Instructor: Prof. Artem Zvavitch

8 problems, 2pts each, YES 6 points extra!

**Problem 1.** *How many 8-digit sequences are there involving exactly six different digits?*

**Problem 2.** *Show that*

$$\sum P(10; k_1, k_2, k_3) = 3^{10}$$

*where  $k_1, k_2, k_3$  are non-negative integer numbers such that  $k_1 + k_2 + k_3 = 10$*

**Problem 3.** *How many arrangements are there of TINKERER with two but not three consecutive vowels?*

**Problem 4.** *How many ways there to distribute 20 different toys among five children? What if two children get 7 toys and three children get 2 toys? What if each child getting 4 toys?*

**Problem 5.** *Hoe many distributions of 24 different objects into three different boxes are there with twice as many objects in one box as in the other two combined?*

**Problem 6.** *How many numbers between 0 and 10000 have a sum of digits equal to 7? Less than or equal to 7?*

**Problem 7.** *How many integer non-negative solutions are there to  $x_1 + x_2 + x_3 + x_4 + x_5 = 28$ ? what if we assume that all solutions are positive?*

**Problem 8.** *How many nonnegative integer solutions are there to the pair of equations  $x_1 + x_2 + x_3 + x_4 + x_5 + x_6 = 29$  and  $x_1 + x_2 + x_3 = 13$ .*