# 2 Project – submit your solution to `petr.kovar@vsb.cz`

## Combinatorics

2.1. Determine in how many ways can be rearranged the letters of the word ANAKONDA so that the consonants and vowels are alternating. (2 b)

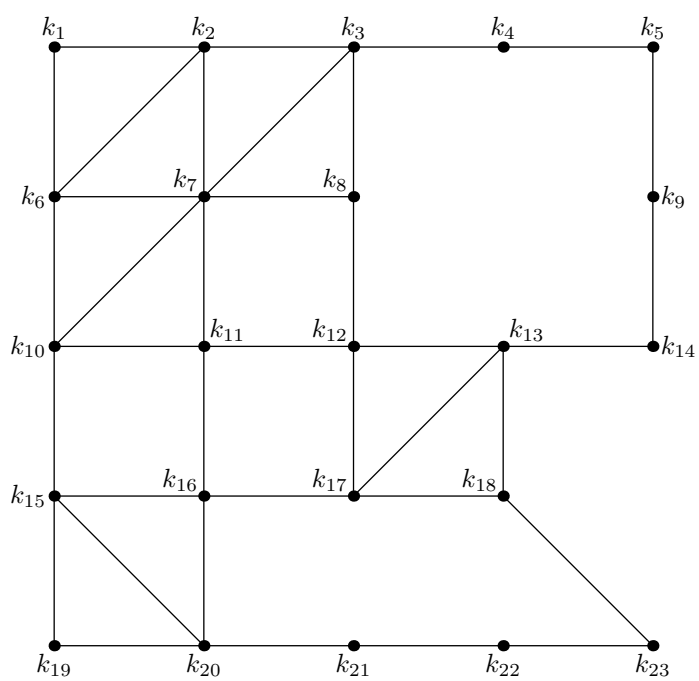
2.2. Traffic police checked the condition of the brakes, condition of the tires, and the first aid kit completeness. Fifteen drivers were fined for poor condition of the brakes. Twelve drivers were fined for worn tires. Ten drivers received fines for incomplete first aid kit. Six drivers were fined for both the poor condition of the brakes and incomplete first aid kit. Eight drivers had worn tires and the poor condition of the brakes and nine drivers were fined for worn tires and incomplete first aid kit. Thirty out of fifty controlled drivers received no fine. Calculate how many drivers received a fine for:

1. only poor condition of the brakes,
2. only worn tires,
3. only incomplete first aid kit,
4. all mentioned transgressions.

(3 b)

## Graph Theory

2.3. Metal collector Pepa rants, that he can check all bins on every street in his neighborhood in two hours. Scheme of streets in his neighborhood is displayed in the graph G. Each street has a length of 200 m (street is represented by an edge between two vertices of the graph, which represent the intersections) and Pepa is pushing his carriage at speed of 3.7 km/h. Decide if Pepa can live up to his bravado, provided that his journey may start and finish at different locations. If he can do so, describe his travel plan (verticies are labeled $k_1$, $k_2$, ..., $k_{23}$). (2 b)




Obrázek 1: Graph from exercise 2.3

2.4. What is the largest number of edges, that a bipartite graph $G$ on $n$ vertices can have without being connected? (3 b)

## Guidelines

Write the project using a computer, include the title with your name, student ID, number of the project, year and a grading table (see the sample project). The project will contain a detailed description of your solution for each problem. If you skip a problem, mark it clearly in the text by saying „*I did not solve the problem number X*“.

Submit your project to `petr.kovar@vsb.cz` as an uncompresed PDF file, use your student ID in the name of your submitted file.

You will be awarded 0 upto 2 or 0 upto 3 points for each of the problems.

Submit your project no later than on **Monday 8.12.2014 at 23:59**.