

## 8. seminar

### Problem 1

There are some generally acceptable business practices in each industry. In a random sample of 73 bankers the following question was asked: "Are there any practices in your industry which can be considered to be unethical?" In this sample 39 answers were negative. Find 95% confidence interval for the proportion of those bankers who don't consider any practice to be unethical.

### Problem 2

Proposals for children allowances provided by department of labor assume that a proportion of families with at most one child is around 55%. Find out at the significance level  $\alpha = 1\%$  whether this assumption is corresponding to the results based on surveyed 1600 young married couples.

The planned number of children	The number of families
0	200
1	800
2	500
3	100

### Problem 3

Within the global survey, which was aimed to compare the quality of life in different countries, the opinion of criminality was polled using following question: "Are you afraid to walk along the less frequented streets under night?" The answers are listed in following table. Assuming that the random samples are independent and of equal size  $n = 300$  find 95% confidence interval estimate for the difference of proportions of positive answers between

- USA and Japan
- USA and Latin Amerika.

The answer	USA	Japan	Latin Amerika
Yes	40%	33%	57%
No	56%	63%	42%
No opinion	4%	4%	1%

### Problem 4

Carrying out the market research, when the individuals or family units are requested to complete the questionnaire, it is important to have as many answers as possible. A way how to increase the interest of families to complete the questionnaire is to introduce it with the reasons why the research is carried out. 250 family units were requested to complete the questionnaires with opening motivation and 101 units referred back. Another sample of 250 family units were requested to complete the questionnaires without opening motivation and only 75 units referred back. At the significance level  $\alpha = 5\%$  run a test whether the proportion of completed questionnaires with opening motivation is equal to or greater than proportion of completed questionnaires without opening motivation. Further determine corresponding  $p$ -value of the test and interpret it.

### Problem 5

The store found out that the value of buy exceeds 300 Kč with the probability 25%. In this case the customer gains prize-draw coupon. Find the probability that in a sample of 100 customers there will be distributed from 20 to 25 coupons. Calculate it a) exactly, b) using approximation by normal distribution.