

STATISTICS APPLIED TO BUSINESS ADMINISTRATION  
ACADEMIC YEAR 2022-2023  
PRACTICAL EXERCISES 6 AND 7 (30 MINUTES)

Date: \_\_\_\_\_

Complete name: \_\_\_\_\_ ID number: \_\_\_\_\_

**EXERCISE 1 (10 POINTS)**

Let  $X$  be a r.v. having a uniform distribution on the interval  $(\theta, 4)$ . In order to test the null hypothesis  $H_0 : \theta = 0$  against the alternative hypothesis  $H_1 : \theta = -2$ , a r.s. of size  $n = 1$ ,  $X_1$ , has been taken, and it is decided that the null hypothesis will be rejected if  $X_1 > 2$ .

1. **(5 points)** Compute the significance level for this test.
2. **(5 points)** Compute the power for this test.

**EXERCISE 2 (10 POINTS)**

A given research focuses on the analysis of the current economic crisis. More specifically, we are interested in analyzing if the size of the firm has an effect on its profits. In order to do so, a r.s. of 600 firms has been taken, and information on the size of the firm (small, medium or large), as well as on its yearly profits for the year 2011 (positive profits or negative profits) was recorded.

|        | Negative | Positive | Total |
|--------|----------|----------|-------|
| Small  | 84       | 156      | 240   |
| Medium | 70       | 130      | 200   |
| Large  | 40       | 120      | 160   |
| Total  | 194      | 406      | 600   |

At the  $\alpha = 0.05$  significance level and using the available information from the sample, can we state that the firm's yearly resulting profits depend on the size of the firm?