EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN

WIRTSCHAFTS- UND
SOZIALWISSENSCHAFTLICHE
FAKULTÄT

Chair of Econometrics, Statistics and Empirical Economics

Prof. Dr. Thomas Dimpfl

Preparatory Course for Mathematical Methods in Economics and Business

5. Exercise Sheet

Exercise 1 (Complex Numbers I)

Calculate:

$a)\,(4+2i)+(5-i) \qquad b)\,(3+5i)(2-i) \qquad c)\,\overline{(321-12i)}$

Exercise 2 (Complex Numbers II)

Simplify to the algebraic form $(a+ib)$:

$a) z = i^6 + i^3 + 2 \qquad b)\, w = \dfrac{i-2}{3i+6}$

Exercise 3 (Complex Numbers III)

Calculate the absolute value and the complex conjugate:

$a)\, w = i^{17} \qquad b)\, z = (1+i)^6$

Exercise 4 (Combinatorics)

A birthday party is attended by 12 guests. Alice and Bob are among them.

a) How many possibilities exist for 2 guests to toast with their champagne glass?

b) After raising their glasses, the guests perform a polonaise. How many arrangement possibilities exist if the polonaise is danced in a line?

c) How many arrangement possibilities are there if there are just 2 people between Alice and Bob and the polonaise is danced in a line?

d) The polonaise is closed to form a circle. How many arrangement possibilities are there now?