

# Introduction to complex analysis

Tuesday exam

1. (8 p) Give a Möbius transformation which transforms the line  $\Re z = 3z$  to circle  $|z| = 1$ .
2. (8 p) Compute the integral

$$\int_C \frac{e^z}{z^2(z-1)^3}$$

when  $C = \{z : |z| = 6\}$ .

3. Study the series  $\sum_{j=1}^{\infty} (j-1) \left(\frac{2z+3i}{5}\right)^{2j}$ .
  - (a) (4 p) For which  $z$  does the series converge?
  - (b) (4 p) Compute the sum of the series.