King Fahd University of Petroleum & Minerals
Department of Mathematical Sciences

MATH-533: Complex Variables I
Spring Semester 2004 (032)

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Homework 1

Due 8.3.2004

Q1. Under what conditions does the equation

$$az + b\overline{z} + c = 0 \ (a, b, c \in \mathbb{C})$$

have exactly one solution? (Compute that solution). When does it represent a line?

Q2. Find the center and the radius of the circle which circumscribes the triangle with vertices a_1, a_2 and a_3.

Q3. Prove *analytically* that the midpoints of parallel chords to a circle lie on a diameter perpendicular to the chords.

Q4. Show that all circles that pass through a and $1/\overline{a}$ $(a \neq 0)$ intersect the unit circle $|z| = 1$ at right angles.

Q5. A cube has its vertices on the Riemann Sphere S and its edges parallel to the coordinate axes. Find the stereographic projections of the vertices.

GOOD LUCK