Math 418

Homework 2

Due February 6

C10!!!. [1] Prove that every proper similitude is either a translation or a composition of a rotation and a homothetic transformation with a center z_0.

C11. Prove that
$$f(z) = \begin{cases} \bar{z}^2/z & \text{for } z \neq 0, \\ 0 & \text{for } z = 0 \end{cases}$$
is not differentiable at 0 but the Cauchy-Riemann equations hold at this point.

C12. Prove that the function
$$f(x + iy) = x^3 + 3xy^2 + i(y^3 + 3x^2y)$$
is differentiable only at points on the coordinate axes.

Problems in Levinson and Redheffer:
1,2,5 in Chapter 1, Section 4:
2,4 in Chapter 2, Section 1;
10 (for $cos z$) and 14 in Chapter 2, Section 2

Read Chapter 1, Sections 4 and 5; Chapter 2, Sections 1 and 2.

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[1]Problems marked by !!! are not mandatory. You are encouraged to submit solutions to the instructor or to the TA. You are welcome to discuss your progress with the instructor.