

Complex Variables

Instructions Please write your name in the upper right-hand corner of the page. Write complete sentences to explain your solutions.

You may consult the textbook and your notes.

1. The final exam for this course is on what date and at what time?

2. Evaluate the line integral $\int_{\gamma} (z + \bar{z}) dz$, where the integration path γ is the unit circle oriented in the standard counterclockwise direction (that is, $\gamma(\theta) = e^{i\theta}$ for $0 \leq \theta < 2\pi$).

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3. The expression 2^i has infinitely many complex values, and all of them lie on a line. Determine complex numbers a and b such that the indicated line has the equation $\operatorname{Re}(az + b) = 0$.

4. Suppose the analytic function f maps the unit disc $\{z : |z| < 1\}$ into (not necessarily onto) itself. How big can $|f''(0)|$ be? Why?