

# Math 122B Homework 5

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## 1 Problem 1

Find a conformal mapping of the upper half-plane onto an equilateral triangle

**Proof.**

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## 2 Problem 2

Suppose  $f$  is an entire function mapping a rectangle to a rectangle. Prove that  $f(z) = az + b$ , where  $a \neq 0$  and  $b$  are complex numbers.

**Proof.**

□

## 3 Problem 3

Let  $R$  be an open, simply connected subset of the complex plane. Let  $z_1, z_2 \in R$ . Prove that there exists a conformal mapping of  $R$  onto  $R$  which takes  $z_1$  into  $z_2$ .

**Proof.**

□

## 4 Problem 4

Let  $R$  be an open, simply connected domain, different than the entire complex  $\mathbb{C}$ . Prove that there exists no conformal mapping of  $\mathbb{C}$  onto  $R$ .

**Proof.**

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