18.04 Recitation 5
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1. Let $T(x, y)$ be the steady state temperature distribution on a square metal plate, where $(x, y) \in [0, 1] \times [0, 1]$. Such a distribution is known to be a harmonic function. Suppose the edges of the square have the following temperature distributions:

- Bottom: $T(x, 0) = 100x^2$

- Top: $T(x, 1) = 100x^2 + 100$

- Left: $T(0, y) = 100y^2$

- Right: $T(1, y) = 100y^2 + 100$

What are the maximum and minimum temperatures on the plate?

2. Show that $u = \sin(x) \cosh(y)$ is harmonic. Find a harmonic conjugate.

18.04 Complex Variables with Applications

Spring 2018