

Exercise 7

- (a) Find the harmonic function in the semi-infinite strip $\{0 \leq x \leq \pi, 0 \leq y < \infty\}$ that satisfies the “boundary conditions”:

$$u(0, y) = u(\pi, y) = 0, \quad u(x, 0) = h(x), \quad \lim_{y \rightarrow \infty} u(x, y) = 0.$$

- (b) What would go awry if we omitted the condition at infinity?