

**Math 365: Honors Analysis I**

Name: \_\_\_\_\_

**Quiz 3** *November 3, 2000*

1. Derive the solution to the heat equation  $a^2 \frac{\partial^2 w}{\partial x^2} = \frac{\partial w}{\partial t}$  subject to the boundary conditions  $w(0, t) = w(\pi, t) = 0$  and  $w(x, 0) = f(x)$ .

2. Derive the solution to the Dirichlet Problem on the unit disk: Find a function  $w$  that is harmonic in the disk and equals a given piecewise smooth function  $f$  on the boundary of the disk.