

MATH 220 E1 QUIZ #13 (20 points)

(12 minutes, 16 April 1999 {13th Week}, PDEs: 10.2,10.3,10.5)

NAME:

SOCIAL SECURITY NUMBER (SSN):

DISCUSSION TIME AND DAY (DT&D):

1. Formally Solve IVP/BVP for Heat Equation:

$$PDE : \frac{\partial u}{\partial t} = 3^2 * \frac{\partial^2 u}{\partial x^2}, \quad 0 < x < \pi/2, \quad t > 0;$$

$$BCs : u(0, t) = 0 = u(\pi/2, t), \quad t > 0;$$

$$IC : u(x, 0) = 10 * \sin(2x) - 0.1 * \sin(4x) \\ + 0.001 * \sin(8x), \quad 0 < x < \pi/2;$$

by Separation of Variables and Fourier Series Methods. You Must Show Your Work.

Fourier Sine Coefficient for $f(x)$ on $0 < x < L$ (if needed):

$$FSC : b_n = \frac{2}{L} \int_0^L f(x) \sin\left(\frac{n\pi x}{L}\right) dx;$$