

**Math 325, Quiz 3**  
**27 November 1991**

1. Find the solution of the heat conduction problem  $u_{xx} = u_t$  with boundary conditions

$$u(0, t) = 0, \quad u(1, t) = 0 \text{ for all } t > 0$$

and

$$u(x, 0) = \sin 3x \quad 0 < x < 1.$$

2. The point  $(0, 0)$  is a critical point of

$$\begin{aligned}x' &= -\sin x + y \\y' &= x^2 - 2ye^y\end{aligned}$$

Find the type and stability of this critical point.