m-3150-001   Midterm exam 2

Makeup

Your name ....

1. Find the displacement $u(x,t)$ of a string, $x \in [0,5]$ if its initial displacement $u(x,0)$ and the initial speed are

$$u(x,0) = 0, \quad \frac{\partial(u(x,t))}{\partial t}\Big|_{t=0} = \sin(\pi x)$$

and the spring constant c is $c = 2$.

3. The left end of a rod of the length three ($x \in [0,3]$) is thermo-insulated, and the right end is kept at zero temperature.

$$\left.\frac{\partial u(x,t)}{\partial x}\right|_{x=0} = 0, \quad u(3,t) = 0, \quad \forall t \in [0, \infty).$$

Find a general solution to the heat problem, assuming that the initial temperature is given, $u(x,0) = f(x)$ and the diffusivity constant c is equal to one, $c = 1$.