

### HOMEWORK #35 (M427K FALL 2004)

You are supposed to solve for  $u(x, t)$  in the Wave equation (defined on the interval  $0 \leq x \leq \pi$ ) (Partial Differential Equation)

$$\frac{\partial^2 u}{\partial t^2} = a^2 \frac{\partial^2 u}{\partial x^2}$$

Using the following “initial+boundary” conditions:

- 1)  $u(0, t) = 0$
- 2)  $u(\pi, t) = 0$
- 3)  $u(x, 0) = f(x)$
- 4)  $\frac{\partial u}{\partial t}(x, 0) = 0$

1.  $f(x) = \cos(3x) + x^2$

2.  $f(x) = \sin(3x) + x$