Assignment Question 1

Find the displacement of a string, $u(x,t)$, of length $L = 1$, when $c^2 = 1$, $u_t(x,0) = 0$ and initial displacement given by

$$u(x,0) = \begin{cases} \frac{k}{a}x & \text{for } 0 \leq x \leq a, \\ \frac{k}{(1-a)}(1-x) & \text{for } a \leq x \leq 1. \end{cases}$$

Also sketch $u(x,0)$.

Assignment Question 2

Given that the function

$$w(x,t) = g(t)e^{-x^2/(4c^2t)}$$

satisfies the one dimensional heat equation, obtain a differential equation for $g(t)$ and then find its general solution. Show all working.

Extra Practice Questions

Problem Set K11.3 p.594 Numbers 3,4,7.

Solutions to Assignment questions are to be handed in at the end of your tutorial on Thursday, 9th of October or Friday, 10th of October.