Assignment 9

1. The governing equation for heat transfer in a particular case is:

   $\frac{d^2Y}{dx^2} = m^2Y$, where m^2 is a parameter. For the given problem its value is 0.01. The boundary conditions are $Y = 1$ at $x = 0$ and $Y = 0$ at $x = 10$. The solution for this equation is $Y = a(e^{0.1x} - e^{-0.1x}) + e^{-0.1x}$, where $a = -\frac{e^{-1}}{(e-e^{-1})}$

   (a) Solve this problem by second order Finite Difference Method with $h = 2$. Also obtain the normalised error at all the points.

   (b) Solve the problem again with $h = 1$ to improve the accuracy