**Flow of a Newtonian fluid in a circular pipe**

Governing equation (as discussed in class):

Boundary conditions

Solving this problem at Pressure drop = 2.8 x 105 Pa, Viscosity = 0.492 Pa.s,

Length of the pipe = 4.88 m and Radius of the pipe = 0.0025 m

Velocity profile from Matlab:



Code : flow\_of\_newtonian\_fluid\_example.m (please check the uploaded file)

**Exercise Problem 9.1 (Finlayson book):**

A chemical reactor with axial dispersion is governed by the following equations:

Boundary conditions:

Solve for Da =8, v = 3 and Pe = 15.

**Concentration profile in the axial reactor**

****

**Matlab code: Exercise\_9\_1.m**

**Exercise Problem 9.1 (Finlayson book):**

**The following equations giverns diffusion and reaction of carbon monoxide in the an isothermal catalyst.**

Boundary conditions: dc/dr = 0 at r = 0 and C=1 at r =1

Concentration profile:



Matlab file: excercise\_9\_2.m