**FPST 3373 Lab week 13 Date: Name: Xinyu Liu**

1. Fundamentals of excel
   1. Autofill
   2. Naming cell
   3. Equation typing
   4. Goal seek (5x +2 = 10, 5x2+2x+2 = 10, 5x3+2x2+2x+2 = 10, 5x4+2x3+2x2+2x+2 = 10)
2. For a 0.4 m diameter circular heptane pan fire, establish a spreadsheet to calculate and compare the followings for 0.1 < z < 3.0:
   1. Ideal plume’s plume velocity(centerline), plume mass flow rate, and temperature (=ΔT)
   2. Zukoski’s mass flow rate
   3. Heskestad’s plume velocity(centerline), plume mass flow rate, and temperature (=ΔT)
   4. McCaffrey’s plume velocity(centerline), and temperature (=ΔT)

Use the following properties:

Air density = 1.2 kg/m3,

Gravity = 9.8 m/s2,

Specific heat of air = 1.1 kJ/kg-K

Ambient Temp. = 293K

Heat of combustion of heptane = 44500 kJ/kg





Convective fraction of heptane fire = 0.7