HW 6 – Multicomponent Flash

1. One thousand kmol of equilimolar mixture of benzene, toluene, and n-hexane is flashed to a pressure of 2 atm abs. After flashing, the system contains 50 mol% vapor. In solving this problem, use the Antoine equation to generate vapor pressure data and assume ideal behavior to use that data to develop K-values.

(a) What is the mass of the vapor and liquid phases?
(b) What are the mass compositions of the vapor and liquid phases?

I would suggest setting this up in Excel… but that's not required.

2. A mixture of 500 kmol benzene, 100 kmol toluene, and 100 kmol n-hexane is flashed to a pressure of 1 atm abs. After flashing, the system contains 0.2 mole fraction n-hexane in the liquid phase. In solving this problem, use the Antoine equation to generate vapor pressure data and assume ideal behavior to use that data to develop K-values.

(a) What is the molar vapor fraction of the system (f)?
(b) What is the composition of the vapor and liquid phases?

I would suggest setting this up in Excel… but that's not required.