Problem 3 - Sample Test

n1 CO2 + n2 CO + n3 O2 is what we have

1 CO2 and 5 O2 is what we started with

Carbon

$1 = n1 + n2$

Oxygen

$12 = 2 \cdot n1 + n2 + 2 \cdot n3$

total

$n = n1 + n2 + n3$

$y1 = \frac{n1}{n}$ mole fraction of CO2

$y2 = \frac{n2}{n}$ mole fraction of CO

$y3 = \frac{n3}{n}$ mole fraction of O2

$P = 9$ Pressure in Atm.

$Kp = 0.1502$

$Kp = y2 \cdot P \cdot \frac{\sqrt{y3 \cdot P}}{y1 \cdot P}$

Problem 4

4. For the following multiple choice question, one response is the best description of the answer. Identify it. Answers indicated with <----------

a) For constant pressure adiabatic combustion,
i. the volume is constant
ii. the enthalpy is constant <--------------
iii. the internal energy is constant
iv. the entropy is constant
v. none of the above

b) In describing the compression stroke in an IC engine, we frequently assume that it ...
i. takes place at constant pressure
ii. is adiabatic
iii. is reversible
iv. is isentropic <--------------
v. takes place at constant temperature

c) The study we have made of chemical equilibrium enables us to ...
i. describe the composition of the unburned mixture at intake
ii. describe the composition of the products of combustion at all temperatures

iii. describe the composition of the products of combustion at low temperature
iv. describe the composition of the products of combustion at high temperature<----------
v. describe the composition of the unburned mixture just before combustion is initiated

d) Which of the following statements best describes chemical equilibrium as we have studied it
vi. the change in entropy as you go from reactants to products is 0.
vii. the change in specific volume is zero
viii. the enthalpy of the products is equal to the enthalpy of the reactants
ix. the internal energy of the products is equal to the internal energy of the reactants
x. the Gibbs Free Energy of the products is equal to the Gibbs Free Energy of the reactants<----

Unit Settings: [kJ]/[K]/[kPa]/[kmol]/[radians]

Kp = 0.1502	n = 6.026	n1 = 0.948	n2 = 0.05197	n3 = 5.026	P = 9
y1 = 0.1573	y2 = 0.008625	y3 = 0.8341			