RICE Table Problems 2 cont.

3) For the reaction:

$$H_2(g) + I_2(g) \rightleftarrows 2\,HI(g)$$

the equilibrium constant, Keq, is 55

If the initial concentration of the hydrogen and iodine before reacting were both 0.1 mol/L and no HI was present, what is the hydrogen iodide concentration in mol/L at equilibrium?

	H_2	+	I_2	⇌	2HI
R	0.1		0.1		∅
I					+2x
C	−x		−x		2x
E	0.1−x		0.1−x		

$$K_{eq} = \frac{[HI]^2}{[H_2][I_2]}$$

$$55 = \frac{(2x)^2}{(0.1-x)^2}$$

$$\sqrt{55} = \sqrt{\frac{(2x)^2}{(0.1-x)^2}}$$

$$7.4 = \frac{2x}{0.1-x}$$

$$(7.4)(0.1-x) = 2x$$

$$0.74 - 7.4x = 2x$$

$$\frac{0.74}{9.4} = \frac{9.4x}{9.4}$$

$$x = 0.079 \frac{mol}{L}$$

$$[HI] = 2(0.79) = 0.16 \frac{mol}{L}$$

4) For the reaction:

$$A(g) + B(g) \leftrightarrow C(g) + D(g)$$

no RICE table needed because the ⇌ conc are given

the equilibrium concentration of a A, B, C and D in mol/L are respectively 0.11 - x, 0.11 - x, and x and x. The equilibrium constant for the reaction is 100. What is the concentration for C in mol/L at equilibrium?

$$K_{eq} = \frac{[C][D]}{[A][B]} = \frac{(x)(x)}{(0.11-x)^2} = 100 = \frac{x^2}{(0.11-x)^2}$$

$$10 = \frac{x}{0.11-x}$$

$$x = (0.11-x)\,10$$

$$x = 1.1 - 10x$$

$$11x = 1.1$$

$$x = 0.1\ mol/L = [C]$$