Equilibrium in Chemical Reactions
Homework Unit 9 - Topic 5

Representing Equilibrium on a Graph

A) Patterns in equilibrium formation: Charts of Concentration vs. Time

Examine the following table of the concentration of reactants (H_2 and I_2) and the product (HI) in the following equilibrium reaction: $H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$

| Time (s)	[H_2]		[I_2]	[HI]
0.1	0.11	$\rightleftharpoons$	0.11	0.07
0.2	0.08		0.08	0.070
0.3	0.06		0.06	0.110
0.4	0.05		0.05	0.130
0.5	0.05		0.05	0.130

1. Observe the data table above. 'Equilibrium' was achieved at ____.4____ seconds.

2. Explain why you picked that time in *terms of concentration* of all substances. _____
    <u>The concentration of reactants and products became constant.</u>

    _____

B) Patterns in equilibrium formation: Graphs of Concentration vs. Time
Consider the following equilibrium reaction: $Cl_{2(g)} \ PCl_{3(g)} \rightleftharpoons PCl_{5(g)}$

Concentration of Reactants & Products vs. Time
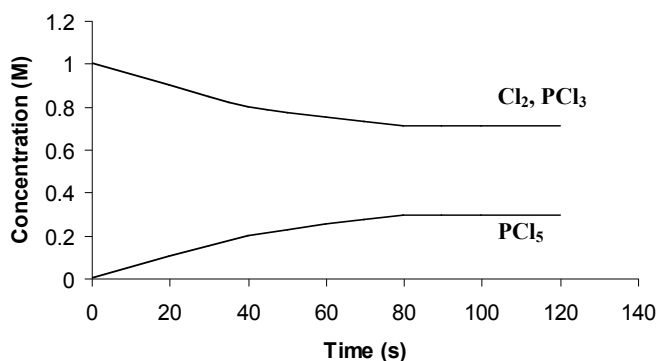
Answer the following questions about the graph above.
3. What is happening to the concentration of Cl_2 as time goes by? _____ What about the PCl_5 concentration? _____

4. At what time (approximate) was equilibrium obtained? ___80 sec.___

5. What feature of the graph tells you that equilibrium was obtained? _____
    <u>the graph plateaus... the concentrations become constant.</u>