Equilibrium ICE Table Questions

Apprentice Difficulty Level
Question Group 1
Question 1

Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$
A container is filled with 2.00 M PCl_5. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 0.40 M.

	PCl_5	⇄	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.
Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.
Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.
So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).
Given that we know $[PCl_5]_{eq}$ is 0.40 M, determine the value of x.
Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.
Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 2

Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$

A container is filled with 3.00 M PCl_5. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 0.80 M.

	PCl_5	⇄	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[PCl_5]_{eq}$ is 0.80 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 3

Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$

A container is filled with 1.80 M PCl_5. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 0.50 M.

	PCl_5	⇄	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[PCl_5]_{eq}$ is 0.50 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 4

Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$

A container is filled with 2.6 M PCl_5. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 0.80 M.

	PCl_5	⇄	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[PCl_5]_{eq}$ is 0.80 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question Group 2
Question 5
Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$
A container is filled with 2.00 M Cl_2 and 2.00 M PCl_3. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 0.60 M.

	PCl_5	⇄	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.
Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.
Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.
So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).
Given that we know $[PCl_5]_{eq}$ is 0.60 M, determine the value of x.
Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.
Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 6

Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$

A container is filled with 2.50 M Cl_2 and 2.50 M PCl_3. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 0.70 M.

	PCl_5	⇄	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[PCl_5]_{eq}$ is 0.70 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 7

Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$

A container is filled with 2.80 M Cl_2 and 2.80 M PCl_3. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 0.80 M.

	PCl_5	⇄	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[PCl_5]_{eq}$ is 0.80 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 8

Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$

A container is filled with 1.90 M Cl_2 and 1.90 M PCl_3. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 0.40 M.

	PCl_5	⇄	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[PCl_5]_{eq}$ is 0.40 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question Group 3
Question 9
Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$
A container is filled with 2.00 M PCl_5, 1.80 M Cl_2 and 1.80 M PCl_3. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 0.1.20 M.

	PCl_5	$\rightleftarrows$	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.
Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.
Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.
So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).
Given that we know $[PCl_5]_{eq}$ is 1.20 M, determine the value of x.
Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.
Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 10

Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$

A container is filled with 1.60 M PCl_5, 2.00 M Cl_2 and 2.00 M PCl_3. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 0.1.20 M.

	PCl_5	⇄	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[PCl_5]_{eq}$ is 1.20 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 11

Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$

A container is filled with 2.40 M PCl_5, 2.80 M Cl_2 and 2.80 M PCl_3. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 0.1.80 M.

	PCl_5	⇄	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[PCl_5]_{eq}$ is 1.80 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 12

Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$

A container is filled with 1.50 M PCl_5, 1.80 M Cl_2 and 1.80 M PCl_3. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 0.0.90 M.

	PCl_5	⇄	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[PCl_5]_{eq}$ is 0.90 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question Group 4
Question 13
Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$
A container is filled with 1.00 M PCl_5, 2.80 M Cl_2 and 3.00 M PCl_3. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 1.40 M.

	PCl_5	⇄	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.
Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.
Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.
So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).
Given that we know $[PCl_5]_{eq}$ is 1.40 M, determine the value of x.
Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.
Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 14

Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$

A container is filled with 0.80 M PCl_5, 2.60 M Cl_2 and 3.20 M PCl_3. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 1.20 M.

	PCl_5	$\rightleftarrows$	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[PCl_5]_{eq}$ is 1.20 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 15

Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$

A container is filled with 0.90 M PCl_5, 3.6 M Cl_2 and 2.50 M PCl_3. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 1.40 M.

	PCl_5	$\rightleftarrows$	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[PCl_5]_{eq}$ is 1.40 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 16

Consider the reversible system: $PCl_{5(g)} \rightleftarrows Cl_{2(g)} + PCl_{3(g)}$

A container is filled with 1.00 M PCl_5, 3.4 M Cl_2 and 2.80 M PCl_3. The reaction proceeds to equilibrium. The equilibrium concentration of PCl_5 is 1.60 M.

	PCl_5	⇄	Cl_2	PCl_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[PCl_5]_{eq}$ is 1.60 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Master Difficulty Level
Question Group 5
Question 17

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 2.00-L container is filled with 6.00 mol of N_2 and 5.40 mol of H_2. Once equilibrium is reached, there are 4.80 mole of N_2 present.

	N_2	H_2	$\rightleftarrows$	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 2.40 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 18

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A container is filled with 3.20 M N_2 and 3.20 M H_2. The reaction proceeds to equilibrium. The equilibrium concentration of N_2 is 2.50 M.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 2.50 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 19

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A container is filled with 2.20 M N_2 and 2.20 M H_2. The reaction proceeds to equilibrium. The equilibrium concentration of N_2 is 1.80 M.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 1.80 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 20

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A container is filled with 1.80 M N_2 and 1.80 M H_2. The reaction proceeds to equilibrium. The equilibrium concentration of N_2 is 1.50 M.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 1.50 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question Group 6
Question 21

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A container is filled with 2.50 M NH_3. The reaction proceeds to equilibrium. The equilibrium concentration of N_2 is 0.60 M.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 0.60 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 22

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A container is filled with 2.00 M NH_3. The reaction proceeds to equilibrium. The equilibrium concentration of N_2 is 0.50 M.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 0.50 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 23

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A container is filled with 1.80 M NH_3. The reaction proceeds to equilibrium. The equilibrium concentration of N_2 is 0.50 M.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 0.50 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 24

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A container is filled with 3.00 M NH_3. The reaction proceeds to equilibrium. The equilibrium concentration of N_2 is 0.60 M.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 0.60 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question Group 7
Question 25

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A container is filled with 2.50 M N_2, 3.50 M H_2, and 3.00 M NH_3. The reaction proceeds to equilibrium. The equilibrium concentration of N_2 is 2.00 M.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 2.00 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 26

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A container is filled with 2.40 M N_2, 2.80 M H_2, and 1.40 M NH_3. The reaction proceeds to equilibrium. The equilibrium concentration of N_2 is 2.00 M.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 2.00 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 27

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A container is filled with 3.00 M N_2, 2.80 M H_2, and 1.40 M NH_3. The reaction proceeds to equilibrium. The equilibrium concentration of N_2 is 2.50 M.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 2.50 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 28

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A container is filled with 2.10 M N_2, 2.60 M H_2, and 0.50 M NH_3. The reaction proceeds to equilibrium. The equilibrium concentration of N_2 is 1.60 M.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 1.60 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question Group 8
Question 29

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A container is filled with 1.40 M N_2, 0.80 M H_2, and 3.40 M NH_3. The reaction proceeds to equilibrium. The equilibrium concentration of N_2 is 1.80 M.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 1.80 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 30

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A container is filled with 0.80 M N_2, 0.80 M H_2, and 3.60 M NH_3. The reaction proceeds to equilibrium. The equilibrium concentration of N_2 is 1.30 M.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 1.30 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 31

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A container is filled with 0.40 M N_2, 0.60 M H_2, and 3.60 M NH_3. The reaction proceeds to equilibrium. The equilibrium concentration of N_2 is 1.00 M.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 1.00 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 32

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A container is filled with 1.00 M N_2, 1.00 M H_2, and 2.80 M NH_3. The reaction proceeds to equilibrium. The equilibrium concentration of N_2 is 1.30 M.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use the number pad to complete.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know $[N_2]_{eq}$ is 1.30 M, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Wizard Difficulty Level
Question Group 9
Question 33

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 2.00-L container is filled with 6.00 mol of N_2 and 5.40 mol of H_2. Once equilibrium is reached, there are 2.40 mol of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know there are 2.40 mol of NH_3 per 2.00 L at equilibrium, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 34

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 4.00-L container is filled with 4.80 mol of N_2 and 6.00 mol of H_2. Once equilibrium is reached, there are 1.60 mol of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know there are 1.60 mol of NH_3 per 4.00 L at equilibrium, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 35

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 1.50-L container is filled with 4.50 mol of N_2 and 7.50 mol of H_2. Once equilibrium is reached, there are 3.00 mole of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know there are 3.00 mol of NH_3 per 1.50 L at equilibrium, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 36

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 0.50-L container is filled with 3.20 mol of N_2 and 4.50 mol of H_2. Once equilibrium is reached, there are 2.00 mol of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know there are 2.00 mol of NH_3 per 0.50 L at equilibrium, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question Group 10
Question 37
Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$
A 1.50-L container is filled with 7.50 mol of NH_3. Once equilibrium is reached, there are 4.50 mol of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.
Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.
Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.
So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).
Given that we know there are 4.50 mol of NH_3 per 1.50 L at equilibrium, determine the value of x.
Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.
Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 38

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 2.00-L container is filled with 8.00 mol of NH_3. Once equilibrium is reached, there are 4.80 mol of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know there are 4.80 mol of NH_3 per 2.00 L at equilibrium, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 39

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 2.00-L container is filled with 6.00 mol of NH_3. Once equilibrium is reached, there are 3.20 mol of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know there are 3.20 mol of NH_3 per 2.00 L at equilibrium, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 40

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 0.50-L container is filled with 2.20 mol of NH_3. Once equilibrium is reached, there are 1.40 mol of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know there are 1.40 mol of NH_3 per 0.50 L at equilibrium, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question Group 11
Question 41

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 0.50-L container is filled with 1.60 mol of N_2, 1.80 mol of H_2, and 0.70 mol of NH_3. Once equilibrium is reached, there are 1.30 mol of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know there are 1.30 mol of NH_3 per 0.50 L at equilibrium, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 42

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 0.50-L container is filled with 1.80 mol of N_2, 2.10 mol of H_2, and 1.75 mol of NH_3.

Once equilibrium is reached, there are 2.25 mol of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know there are 2.25 mol of NH_3 per 0.50 L at equilibrium, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 43

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 2.00-L container is filled with 3.20 mol of N_2, 4.00 mol of H_2, and 1.40 mol of NH_3.

Once equilibrium is reached, there are 2.60 mol of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know there are 2.60 mol of NH_3 per 2.00 L at equilibrium, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 44

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 2.00-L container is filled with 4.80 mol of N_2, 5.20 mol of H_2, and 0.60 mol of NH_3.

Once equilibrium is reached, there are 2.60 mol of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know there are 2.60 mol of NH_3 per 2.00 L at equilibrium, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question Group 12
Question 45

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 2.00-L container is filled with 2.40 mol of N_2, 2.40 mol of H_2, and 8.00 mol of NH_3.

Once equilibrium is reached, there are 6.40 mol of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know there are 6.40 mol of NH_3 per 2.00 L at equilibrium, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 46

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 2.00-L container is filled with 2.00 mol of N_2, 2.00 mol of H_2, and 7.20 mol of NH_3.

Once equilibrium is reached, there are 5.60 mol of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know there are 5.60 mol of NH_3 per 2.00 L at equilibrium, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 47

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 0.50-L container is filled with 0.30 mol of N_2, 0.40 mol of H_2, and 1.60 mol of NH_3.

Once equilibrium is reached, there are 1.20 mol of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know there are 1.20 mol of NH_3 per 0.50 L at equilibrium, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.

Question 48

Consider the reversible system: $N_{2(g)} + 3\ H_{2(g)} \rightleftarrows 2\ NH_{3(g)}$

A 0.50-L container is filled with 0.50 mol of N_2, 0.50 mol of H_2, and 1.40 mol of NH_3.

Once equilibrium is reached, there are 1.10 mol of NH_3 present.

	N_2	H_2	⇄	NH_3
I				
C				
E				

Identify the K expression for this reaction.

Tap on a table cell in the first row (Initial concentration) of the ICE Table and use volume and # of moles to calculate the [ ]. Use the number pad to enter concentration values.

Tap on a table cell in the second row (Change in concentration) and use the symbol pad to complete.

So the third row (Equilibrium concentration) of the ICE Table is the initial concentration plus the change in concentration (i.e., the sum of the first two rows).

Given that we know there are 1.10 mol of NH_3 per 0.50 L at equilibrium, determine the value of x.

Now that you know x, use the expressions for the equilibrium [ ] (E row of ICE table) to determine the value of all equilibrium [ ]s.

Calculate the value of K. For best results, enter the answer to at least 3 significant digits.