1. The chemical equation which describes how the strong acid HCl dissociates in aqueous solution is,

\[
HCl(aq) \rightleftharpoons H^+(aq) + Cl^-(aq)
\]

a. In the data you obtained earlier (Acids, Bases and pH, pg. 55), the initial concentration of HCl is 0.100 M. In the space provided below (ICE Table), enter the initial concentration of HCl, H\(^+\), and Cl\(^-\).

Based on the measured pH of this solution, calculate and enter the equilibrium concentration of H\(^+\).

\[
HCl(aq) \rightleftharpoons H^+(aq) + Cl^-(aq)
\]

<table>
<thead>
<tr>
<th>Initial Concentrations</th>
<th>_____</th>
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</thead>
<tbody>
<tr>
<td>Change</td>
<td>_____</td>
<td>_____</td>
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</tr>
<tr>
<td>Equilibrium Concentrations</td>
<td>_____</td>
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</tbody>
</table>

b. Calculate the change in [H\(^+\)].

c. Using the balanced chemical equation and the calculated change in [H\(^+\)], calculate the change in [HCl] and [Cl\(^-\)].

d. Calculate the equilibrium concentration of HCl\((aq)\) and Cl\(^-\)(aq).

e. Estimate the equilibrium constant for the dissociation of HCl\((aq)\).