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Solution: The total volume is 65 mL so the final Concentrations are:
[HCl] = 25/65(0.40 M) = 0.154 M
[NH_3] = 40/65(0.30 M) = 0.184 M

In this case the [HCl] < [NH_3] so this will make a buffer. Assume that the strong acid reacts completely then at equilibrium we have:

[NH_3] = 0.184 – 0.154 M = 0.03 M and [NH_4^+] = 0.154 M

Examples: One strong and one weak

$$HCl + NH_3 \rightarrow NH_4^+ + Cl^-$$

$$NH_4^+ \rightarrow H^+ + NH_3$$

$$pH = pK_a + \log_{10}\left(\frac{[NH_3]}{[NH_4^+]}\right)$$

$$pH = 9.4 + \log_{10}\left(\frac{0.03}{0.154}\right)$$

$$pH = 8.68$$