5.1.3 Exercise 4 - Acid-alkali titrations

1. a) Calculate the pH of a solution of 0.10 moldm-3 HCl

b) 25 cm3 of this solution is pipetted into a conical flask and 0.1 moldm-3 NaOH is added gradually to it until in excess. Calculate the pH of the mixture

1. after 10 cm3 of NaOH has been added
2. after 20 cm3 of NaOH has been added
3. after 24 cm3 of NaOH has been added
4. after 24.95 cm3 of NaOH has been added
5. after 25.05 cm3 of NaOH has been added
6. after 30 cm3 of NaOH has been added
7. a) Calculate the pH of a solution of 0.10 moldm-3 CH3COOH (Ka = 1.7 x 10-5 moldm-3)

b) 25 cm3 of this solution is pipetted into a conical flask and 0.1 moldm-3 NaOH is added gradually to it until in excess. Calculate the pH of the mixture

1. after 10 cm3 of NaOH has been added
2. after 20 cm3 of NaOH has been added
3. after 24 cm3 of NaOH has been added
4. after 24.95 cm3 of NaOH has been added
5. after 25.05 cm3 of NaOH has been added
6. after 30 cm3 of NaOH has been added
7. For both reactions, plot a graph to show how the pH changes with the volume of NaOH added