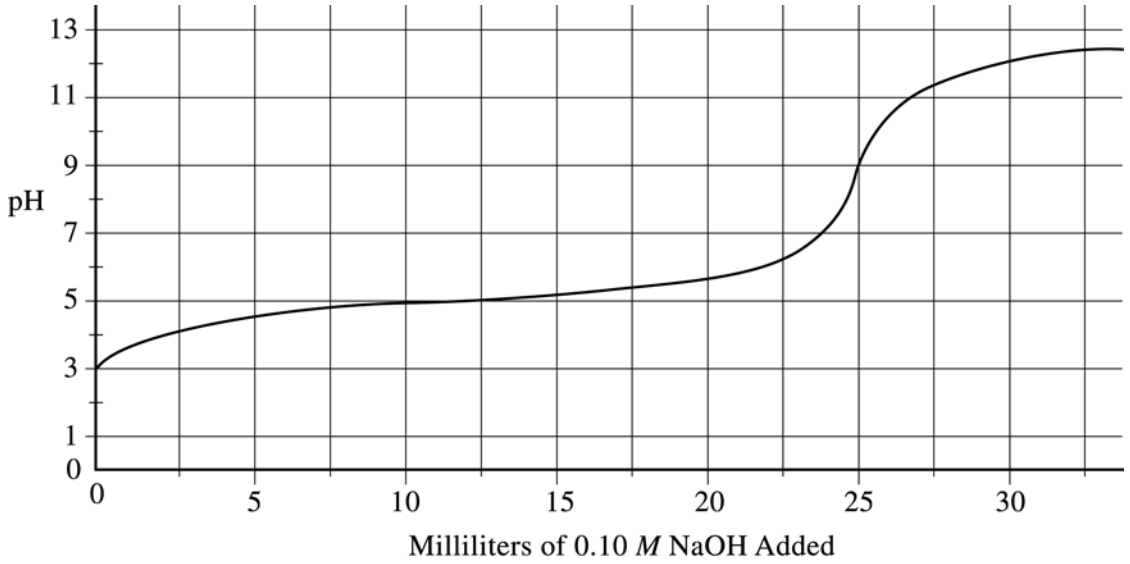
8. The graph below shows the result of the titration of a 25 mL sample of a 0.10 *M* solution of a weak acid, HA, with a strong base, 0.10 *M* NaOH.



(a) Describe two features of the graph above that identify HA as a weak acid.

(b) Describe one method by which the value of the acid-dissociation constant for HA can be determined using the graph above.

(c) On the graph above, sketch the titration curve that would result if 25 mL of 0.10 *M* HCl were used instead of 0.10 *M* HA.

(d) A 25 mL sample of 0.10 *M* HA is titrated with 0.20 *M* NaOH.

(i) What volume of base must be added to reach the equivalence point?

(ii) The pH at the equivalence point for this titration is slightly higher than the pH at the equivalence point in the titration using 0.10 *M* NaOH. Explain.

END OF EXAMINATION