1. Determine the $[H_3O^+]$ and pH of 0.200 M lactic acid (HC₃H₅O₃, $K_a = 1.4 \times 10^{-4}$). (Answer: $[H_3O^+] = 0.00522$ M, pH = 2.28)

2. Determine the pH of 0.015 M morphine, a weak base with $K_b = 1.6 \times 10^{-6}$. (Call morphine B in your equilibrium.) (Answer: pH = 10.19)



3. Calculate the pH of a solution of 0.500 M sodium acetate (for acetic acid, $K_a = 1.8 \times 10^{-5}$). (Answer: pH = 9.22)

4. Calculate the pH of 0.100 M oxalic acid (HOOC-COOH), a diprotic acid with $K_{a1} = 6.0 \times 10^{-2}$ and $K_{a2} = 6.1 \times 10^{-5}$. What is the concentration of the oxalate ion (C₂O₄²⁻)? (Answer: pH = 1.28, [A^{2-}] = $6.1 \times 10^{-5} M$)



5. Calculate the K_a value of a weak acid, (HA) if a 0.115 M solution has a pH of 3.29. (Answer: 2.3×10^{-6})

6. Calculate the pH and percent ionization of 0.225 M benzoic acid ($K_a = 6.5 \times 10^{-5}$). (Answer: pH = 2.42, % *ionization* = 1.7%)