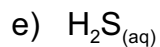
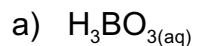


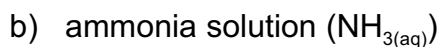
$$K_a = \frac{[\text{H}_3\text{O}^+][\text{conjugate base}]}{[\text{weak acid}]}$$

$$K_b = \frac{[\text{OH}^-][\text{conjugate acid}]}{[\text{weak base}]}$$

1. Write the Brønsted-Lowry equation and the K_a expression for:



2. Write the Brønsted-Lowry equation and the K_b expression for:



3. Derive an expression for $K_a \times K_b$ by multiplying:

a) 1.c) x 2.c)

b) 1.e) x 2.d)

4. Classify the following expressions:

expression	K_a or k_b	For which acid or base
$\frac{[OH^-][HS^-]}{[S^{2-}]}$		
$\frac{[H_3O^+][CN^-]}{[HCN]}$		
$\frac{[H_3O^+][CO_3^{2-}]}{[HCO_3^-]}$		
$\frac{[OH^-][H_2PO_4^-]}{[HPO_4^{2-}]}$		

5. Use the K_a value from the 'strengths' table to calculate the $[H_3O^+]$ in:

a) 0.100 mol/L $HF_{(aq)}$

b) 0.250 mol/L acetic acid