Acids and Bases - pH/Practice **Name:** Key

1) Write the conjugate base for the following acids:
   H_3PO_4, HCl, H_2S

   $H_2PO_3^-$ Cl^- HS^-

2) Write the conjugate acid for the following bases:
   OH^-, HSO_4^-, ClO^-

   H_2O H_2SO_4 $HClO$

3) Identify the acid-base and conjugate acid/conjugate base pair in the following equations.
   a) $HCO_3^- + OH^- \rightleftharpoons CO_3^{2-} + H_2O$

   A B CB CA

   b) $C_5H_5NH^+ + H_2O \rightleftharpoons C_5H_5N + H_3O^+$

   A B CB CA

4) Circle the stronger acid in the following pairs:
   a) H_2S vs H_2Se b) HNO_3 vs HNO_2

   c) $HClO_4$ vs HIO_3 d) $CH_3CHFCOOH$ vs CH_2FCH_2COOH

5) Calculate the pH, pOH, $[H_3O^+]$ or $[OH^-]$ concentrations as indicated in the problem:
   a) pH for 0.65 M HBr

   $-\log[0.65] = 0.19$.

   b) pOH for 0.073 M LiOH

   $-\log[OH^-] = -\log[0.073] = 1.14$.

   c) pH for 0.070 M KOH

   d) $[H_3O^+]$ for lemonade, pH 2.91

   e) $[OH^-]$ for blood plasma, 7.42

6) Classify the following as acidic, basic or neutral salts:

a) LiCl b) KNO_3 c) NH_4Cl d) Na_3PO_4

7) Identify the Lewis acid and the base in the following reactions.

a) $Cu^{2+} + 4NH_3 \rightleftharpoons [Cu(NH_3)_4]^{2+}$

b) $CO_2 + OH^- \rightleftharpoons HCO_3^-$

6) Classify the following as acidic, basic or neutral salts:

a) LiCl neutral

b) KNO_3 neutral

c) NH_4Cl acidic

d) Na_3PO_4 basic

7) Identify the Lewis acid and the base in the following reactions.

a) $Cu^{2+} + 4NH_3 \rightleftharpoons [Cu(NH_3)_4]^{2+}$

LA LB

b) $CO_2 + OH^- \rightleftharpoons HCO_3^-$

LA LB