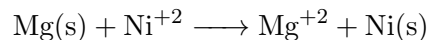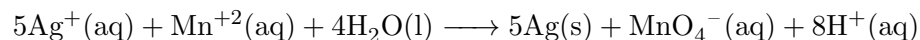Name: _____                                      Date: _____

[5 pt]   1. For the following reaction, calculate (E°) and tell whether the reaction is spontaneous or not under standard-state conditions.

$$Mg(s) + Ni^{+2} \longrightarrow Mg^{+2} + Ni(s)$$

[5 pt]   2. For the following reaction, calculate (E°) and tell wether the reaction is spontaneous or not under standard-state conditions.

$$5Ag^+(aq) + Mn^{+2}(aq) + 4H_2O(l) \longrightarrow 5Ag(s) + MnO_4^-(aq) + 8H^+(aq)$$

[5 pt]   3. The following reaction has E° = 0.27 V: $Cu^{+2}(aq) + 2Ag(s) + 2Br^-(aq) \longrightarrow Cu(s) + 2AgBr(s)$. What is the standard reduction potential for the half-reaction $AgBr(s) + e^- \longrightarrow Ag(s) + Br^-$

[5 pt]   4. The standard sell potential for a lead storage batter is 1.924 V. Calculate $\Delta G°$ (in kJ) for the cell:

$$Pb(s) + PbO_2(s) + 2H^+ + 2HSO_4^- \longrightarrow 2PbSO_4(s) + 2H_2O$$

[5 pt]   5. Calculate the standard cell EMF ($E°$) and $\Delta G°$ for the cell reaction: $3Cu^{+2}(aq)+2\,Cr(s) \longrightarrow 3Cu(s)+ 2Cr^{+3}(aq)$

[5 pt]   6. Calculate the standard cell EMF ($E°$) and $\Delta G°$ for the cell reaction: $2H^+(aq)+Pb(s) \longrightarrow H_2(g)+Pb^{+2}$

[5 pt]   7. Calculate the standard EMF ($E°$) and $\Delta G°$ of a cell that uses the $Mg/Mg^{+2}$ and $Cu/Cu^{+2}$ half-cell reactions at 25°C. Write the equation for the cell reaction that occurs under standard-state conditions.

[5 pt]   8. Arrange the following reducing agents in order of increasing strength under standard-state conditions: Al(s), Pb(s), and Fe(s). Explain.