Equations Review

Name: _____

Part 1: Supply the correct coefficients to balance the following equations (assume all formulas are correct). Then classify each reaction as either synthesis, decomposition, single replacement, double replacement or combustion.

	Type of Reaction
1) ___ NH_3 (g) + ___ HCl (g) ---> ___ NH_4Cl (l)	synthesis
2) ___ $Pb(NO_3)_2$ (aq) + ___ K_2CrO_4 (aq) ---> ___ $PbCrO_4$ (s) + _2_ KNO_3 (aq)	double replacement
3) ___ Cl_2 (g) + _2_ KI (aq) ---> _2_ KCl (aq) + ___ I_2 (s)	single replacement
4) _2_ C_3H_6 (g) + _9_ O_2 (g) ---> _6_ CO_2 (g) + _6_ H_2O (g)	combustion
5) _2_ $Al(OH)_3$ (s) ---> ___ Al_2O_3 (s) + _3_ H_2O (l)	decomposition
6) _4_ Li (s) + ___ O_2 (g) ---> _2_ Li_2O (s)	synthesis
7) _6_ HCl (aq) + ___ Fe_2O_3 (s) ---> _2_ $FeCl_3$ (aq) + _3_ H_2O (l)	double replacement
8) ___ $MgCO_3$ (s) ---> ___ MgO (s) + ___ CO_2 (g)	decomposition

Part 2: Write the correct formulas for all reactants and products, then supply the necessary coefficients to balance the equations. Then classify each equation according to its reaction type.

1) Aqueous calcium iodide is mixed with aqueous mercury (II) nitrate to produce solid mercury (II) iodide and aqueous calcium nitrate.

CaI_2 (aq) + $Hg(NO_3)_2$ (aq) --> HgI_2 (s) + $Ca(NO_3)_2$ (aq) double replacement

2) Aqueous hydrogen peroxide decomposes to form liquid water and oxygen gas.

2 H_2O_2 (aq) --> 2 H_2O (l) + O_2 (g) decomposition

3) Solid aluminum mixed with chlorine gas produces solid aluminum chloride.

2 Al (s) + 3 Cl_2 (g) --> 2 $AlCl_3$ (s) synthesis

4) Manganese metal reacts with aqueous sulfuric acid (H_2SO_4) to produce aqueous manganese (II) sulfate and hydrogen gas.

Mn (s) + H_2SO_4 (aq) --> $MnSO_4$ (aq) + H_2 (g) single replacement

5) Aqueous barium acetate reacts with aqueous sodium phosphide to produce solid barium phosphide and aqueous sodium acetate.

3 $Ba(C_2H_3O_2)_2$ (aq) + 2 Na_3P (aq) --> Ba_3P_2 (s) + 6 $NaC_2H_3O_2$ (aq) double replacement

Part 3: Given the reactants, predict the products and balance the equation:

1) _2_ Al (s) + _6_ HCl (aq) --> $2\ AlCl_3 + 3\ H_2$

2) _2_ C_8H_{18} (l) + _25_ O_2 (g) --> $16\ CO_2 + 18\ H_2O$

3) _2_ SnO (s) --> $2Sn + O_2$

4) ___ $CdBr_2$ (aq) + ___ Na_2S (aq) --> $CdS + 2\ NaBr$

5) ___ C (s) + _2_ Cl_2 (g) --> CCl_4

6) _3_ $CaCl_2$ (aq) + _2_ Na_3PO_4 (aq) --> $Ca_3(PO_4)_2 + 6\ NaCl$

7) ___ Na_2S (aq) + ____ F_2 (g) --> $2\ NaF + S$

8) _2_ KCl (s) --> $2\ K + Cl_2$

Part 4: In the following reactions, balance the reaction and determine what element undergoes oxidation and what element undergoes reduction:

1) _2_ CaO (s) --> _2_ Ca (s) + ___ O_2 (g) Oxidation: __O___ Reduction: __Ca___

2) _2_ Mn (s) + _10_ HI (aq) --> _2_ MnI_5 + _5_ H_2 (g) Oxidation: __Mn__ Reduction: __H___

3) _2_ $SbCl_5$ (s) --> _2_ Sb (s) + _5_ Cl_2 (g) Oxidation: __Cl___ Reduction: __Sb___

4) _3_ Ba (s) + _2_ $AuCl_3$ (aq) --> _2_ $BaCl_2$ (aq) + _2_ Au (s) Oxidation: __Ba___ Reduction: __Au___

5) _2_ Ag (s) + ___ S (s) --> ___ Ag_2S (s) Oxidation: __Ag__ Reduction: __S___

Part 5: Using the activity series, determine whether the reaction will occur or not. For each reaction, predict the products and balance. If no reaction occurs, write NR.

1) ___ Ca (s) + _2_ HCl (aq) --> $CaCl_2 + H_2$

2) ___ $Ca(NO_3)_2$ (aq) + ___ Au (s) --> NR

3) ___ $MgCl_2$ (aq) + ___ K (s) --> $2\ KCl + Mg$

4) _2_ Zn (s) + ___ $PtBr_4$ (aq) --> $Pt + 2\ ZnBr_2$

5) _2_ $Co(ClO_3)_3$ (aq) + _3_ Mg (s) --> $3\ Mg(ClO_3)_2 + 2\ Co$

6) ___ Cu (s) + ___ $Fe(OH)_3$ (aq) --> NR