Determining Oxidation Numbers

1) Each atom in a <u>pure element</u> has an oxidation number = 0.

2) For ions consisting of a single atom, the oxidation number is equal to the charge on the ion.

3) **Fluorine** is ***always*** -1.

4) **Chlorine**, **bromine** and **iodine** are ***always*** -1 ***<u>except</u>*** when combined with oxygen or fluorine.

5) The oxidation number of **hydrogen** is +1 and of **oxygen** is -2.
Exceptions: hydrides (H^{-1}), peroxides (O^{-1}), OF compounds.

6) In <u>neutral compounds</u>, the sum of the oxidation numbers must be zero. In <u>polyatomic ions</u>, the sum of the oxidation numbers must be equal to the ion charge.

Examples:

Cu(s)	Cu: 0	**NaCl**	Cl: -1 Na: +1
NaF	F: -1 Na: +1	**ClO^-**	Cl: +1 O: -2
Al^{3+}	Al: +3	**Fe_2O_3**	Fe: +3 O: -2
H_2O_2	H: +1 O: -1	**AlH_4^-**	Al: +3 H: -1
		$KMnO_4$	K: +1 Mn: +7 O: -2