Friday Worksheet   **Name: ……………….**
**Volumetric analysis worksheet 8 chlorine investigation**

A household cleaner was analysed for its available chlorine as hypochlorite (OCl^-)
A 20.0 mL sample of the bleach was placed in a 250 mL volumetric flask and made to the mark with distilled water. A 20.0 mL aliquot was taken from the volumetric flask and transferred to a conical flask. To the volumetric flask about 5 mL of acidified KI solution was added upon which the solution turned a dark brown colour due to the formation of I_2 according to the reaction below. The KI was added in excess.

1. $ClO^-_{(aq)} + 2I^-_{(aq)} + 2H^+_{(aq)} => I_{2(aq)} + Cl^-_{(aq)} + H_2O_{(l)}$
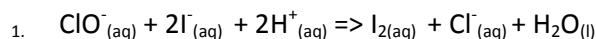
The solution in the conical flask was titrated against a 0.100 M $S_2O_3^{-2}$ and an average titre of 8.51 mL was obtained. The thiosulfate ($S_2O_3^{-2}$) reacts with the iodine molecule according to the equation below.

2. $I_{2(aq)} + 2S_2O_3^{-2}{}_{(aq)} => S_4O_6^{-2}{}_{(aq)} + 2I^-_{(aq)}$
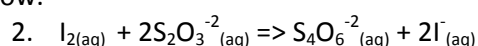
1) Calculate the amount, in mol, of thiosulfate($S_2O_3^{-2}$) in the average titre.

2) Calculate the amount of I_2 present in the conical flask.

3) Calculate the amount of ClO^- in the 20.0 mL aliquot of the diluted bleach in the volumetric flask.

4) Calculate the amount, in mol, of OCl^- in the volumetric flask

5) Calculate the amount, in mol, of OCl^- in a 1 litre container of the bleach.

6) Find the mass of chlorine atoms present as OCl^- ions in one litre of bleach.

7) Calculate the amount of chlorine as a percentage (weight/volume)