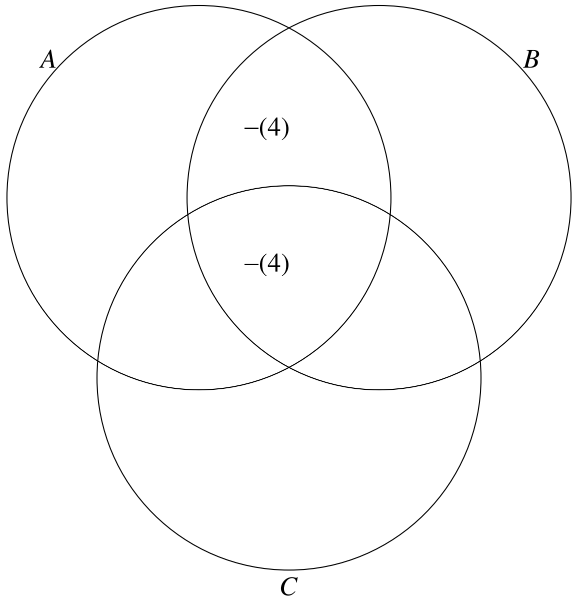

- Consider the +ve and −ve terms below, numbered 1 to 7 terms.

$$
\begin{aligned}
+|A| &\quad \text{(term \#1)}\\
+|B| &\quad \text{(term \#2)}\\
+|C| &\quad \text{(term \#3)}\\
-|A\cap B| &\quad \text{(term \#4)}\\
-|A\cap C| &\quad \text{(term \#5)}\\
-|B\cap C| &\quad \text{(term \#6)}\\
+|A\cap B\cap C| &\quad \text{(term \#7)}
\end{aligned}
$$

- In the above Venn Diagram, we have marked all areas as "−(4)" that are accounted for by the term #4: $-|A\cap B|$; here, "−" indicate that it is a −ve term and "(4)" indicates that it is accounted by term #4.

Problem.

- Fill the diagram by adding similar marks "$+(i)$" and "$-(j)$" etc. correpsonding to the other 6 terms.
- Show that the number of +ve marks for each part of $A\cup B\cup C$ (and only those parts) exceeds the number of −ve marks by eactly 1.
- This proves that the sum of all the terms above equals $|A\cup B\cup C|$.