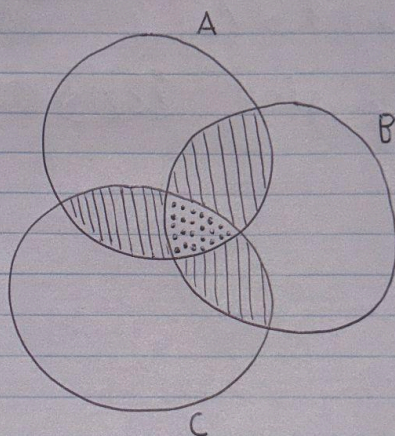


1. prove  $|A \cup B \cup C|$

$$= |A| + |B| + |C| - |A \cap B| - |A \cap C| - |B \cap C| + |A \cap B \cap C|$$



Understanding this:

- Certain Values are counted  $\times 2$  or even  $\times 3$ .

$\therefore$  We use the inclusion-exclusion principle (IEP)

$$3 \bigcirc = A \cup B \cup C = |A| + |B| + |C|$$

$$\text{|||||} = A \cup B \cup C - ((A \cap B) + (B \cap C) + (A \cap C))$$

$$\text{.....} = A \cup B \cup C - (A \cap B \cap C)$$