

Inclusion-Exclusion Principle:

→ Let A & B be any finite sets, then:

$$n(A \cup B) = n(A) + n(B) - n(A \cap B) \rightarrow (i)$$

→ For any finite sets; A, B & C .

$$n(A \cup B \cup C) = n(A) + n(B) + n(C) - n(A \cap B) - n(B \cap C) - n(A \cap C) + n(A \cap B \cap C) \rightarrow (ii)$$

* Group of 80 peoples; 60 likes Eggs & 30 likes fish; find Percentage of Peoples like both

$$n(E) = 60$$

$$n(F) = 30$$

$$n(E \cap F) = ?$$

$$n(E \cup F) = 80$$

$$n(E \cup F) = n(E) + n(F) - n(E \cap F)$$

$$80 = 60 + 30 - n(E \cap F).$$

$$(10) = n(E \cap F).$$

* 200 Students; 50 take math, 140 took economics & 24 took both. How many of them not took any of the course.

$$n(M) = 50$$

$$n(E) = 140$$

$$n(M \cap E) = 24$$

$$n(M \cup E) = 50 + 140 - 24.$$

$$= 166.$$

$$200 - 166 = (34)$$