

# AI5002 - Assignment 6

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## Problem 6.8

A and B are two events such that  $P(A) \neq 0$ .

Find  $P(B/A)$ , if

(i)  $A \subset B$

(ii)  $A \cap B = \phi$

## Solution

Given  $P(A) \neq 0$ .

We know,

$$P(B/A) = \frac{P(A \cap B)}{P(A)} \quad (0.0.1)$$

(i) If  $A \subset B$

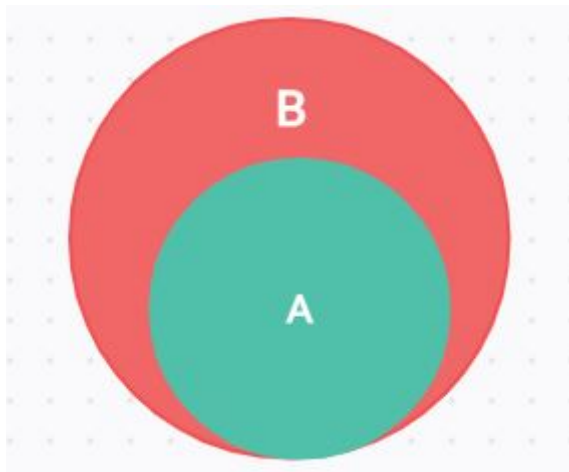


Fig 1.1:  $A \subset B$

$$\Rightarrow A \cap B = A$$

$$\Rightarrow P(A \cap B) = P(A)$$

Putting  $P(A \cap B)$  in (0.0.1), we get

$$P(B/A) = \frac{P(A)}{P(A)} = 1$$

(ii) If  $A \cap B = \phi$



Fig 1.2:  $A \cap B = \phi$

$$\Rightarrow P(A \cap B) = 0$$

Putting  $P(A \cap B)$  in (0.0.1), we get

$$P(B/A) = \frac{0}{P(A)} = 0$$