

5. A and B are two independent events.
 If $P(A) = 0.4$ and $P(A \cup B) = 0.7$, use the formula
 $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ to find $P(B)$.



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

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$0.7 = 0.4 + P(B) - 0.4 P(B)$$

$$0.7 - 0.4 = 0.6 P(B)$$

$$\frac{0.3}{0.6} = P(B)$$

$$0.5 = P(B)$$

10. Given $P(B) = 0.7$, $P(C) = 0.6$ and $P(C|B) = 0.7$, find $P(B \cap C)$.
 Now investigate if B and C are independent.

$$P(B \cap C) = P(B) \times P(C|B)$$

$$= (0.7)(0.7) = 0.49$$

If independent $P(C) = P(C|B)$

$$0.6 \neq 0.7$$