If A and B are two events such that $P(A) = \frac{1}{4}$, $P(B) = \frac{1}{2}$ and $P(A \cap B) = \frac{1}{8}$, find P (not A and not B). Solution:

Given,
$$P(A) = \frac{1}{2}$$

Given,
$$P(A) = \frac{1}{4}$$
, $P(B) = \frac{1}{2}$ and $P(A \cap B) = \frac{1}{8}$.

P (not on A and not on B) =
$$P(A' \cap B')$$

P (not on A and not on B) = P(
$$(A \cup B)'$$
)
$$[A' \cap B' = (A \cup B)']$$

$$= 1 - P(A \cup B)$$

$$= 1 - \mathbf{P}(\mathbf{A})$$

$$= 1 - P(A)$$

$$= 1 - \int P(A)$$

$$= 1 - P(A)$$

 $=1-\frac{5}{9}$

$$= 1 - P(A \cup B)$$
$$= 1 - [P(A) + P(B)]$$

$$= 1 - P(A \cup B)$$

$$= 1 - [P(A) + P(B) - P(A \cap B)]$$

$$= 1 - \left[P(A) + P(B) - P(A) \right]$$

$$= 1 - \left[\frac{1}{4} + \frac{1}{2} - \frac{1}{8} \right]$$