Q.2

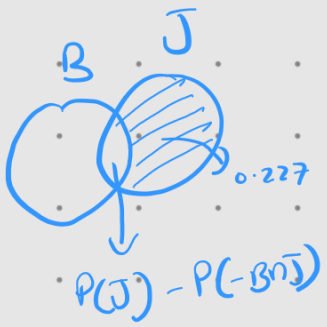
(a) B: read book
J: access journal
C: book club

- $P(B \cup \bar{J}) = 0.91$
- $P(J|B) = 0.40$ $\quad P(\neg J|B) = 0.60$
- $P(C|B) = 0.32$
- $P(J \cap \neg B) = 0.227$
- $P(\neg B \cap \neg J) = 0.09$
- $P(J|\neg B) = 0.716$
- $P(C \cap J) = 0.088$
- $P(C \cup \bar{J}) = 0.631$
- $P(J|C) = 0.40$
- $P(J) = 0.50$
- $P(C|\neg B) = 0.0044$

(b)
- All propositions have $0 \leq P(x) \leq 1$
- Normalisation: $P(B \cup \bar{J}) + P(\neg B \cap \neg J)$
  $= P(B \cup \bar{J}) + P(\neg(B \cup \bar{J})) = P(S)$
  $= 0.91 + 0.09$
  $= 1$
  $\therefore P(\text{Sample Space}) = 1$

(c) Full joint probability

	B	$\neg B$
J	$(B \cap \bar{J})$	$(\neg B \cap J) = 0.227$ (Given)
$\neg J$	$(B \cap \neg J)$	$(\neg B \cap \neg J) = 0.09$ (Given)



$\therefore P(B \cap \bar{J}) = P(\bar{J}) - P(-B \cap \bar{J})$

$= 0.5 - 0.227$

$= 0.273$

$P(B \cap -\bar{J}) = P(B \cup \bar{J}) - P(\bar{J})$

$= 0.91 - 0.50$

$= 0.41$

$\therefore$

	B	$-B$
$\bar{J}$	0.273	0.227
$-\bar{J}$	0.410	0.90