8) A: product is highly successful
B: product is moderately successful
C: poor product
G: good review

9)

$$P(G) = P(G \cap A) + P(G \cap A')$$

Since $P(G|A) = \frac{P(G \cap A)}{P(A)} \Rightarrow P(G \cap A) = P(G|A) \cdot P(A)$

$$P(G \cap A) = (0.95)(0.40) = 0.38$$

$$\Rightarrow P(G) = 0.38 + P(G \cap A')$$

and

$$P(G \cap A') = P(G \cap (B \cup C)) = P((G \cap B) \cup (G \cap C))$$

$$= P(G \cap B) + P(G \cap C) - P(G \cap B \cap C)$$

Since $B \cap C = \phi \Rightarrow G \cap B \cap C = \phi \sim P(\phi) = 0$

$$\Rightarrow P(G \cap A') = P(G \cap B) + P(G \cap C) = P(B) \cdot P(G|B) + P(C)P(G|C)$$

$$P(G \cap A') = (0.35)(0.60) + (0.25)(0.10) = 0.2350$$

Then

$$P(G) = P(G \cap A) + P(G \cap A') = 0.38 + 0.2350 = 0.6150$$

$\therefore P(\text{having a good review}) = 0.6150$ or $\approx 62\%$

b) ~~P(A)~~

$$P(A|G) = \frac{P(G|A) \cdot P(A)}{P(G)} = \frac{(0.95)(0.40)}{0.6150}$$

$$\Rightarrow P(A|G) = 0.6179$$

$\therefore P($ design will be successful $|$ good review$) = 0.6179$

c) $P(A|G') = \frac{P(A \cap G')}{P(G')}$, Since G and G' are mutually exclusive $\Rightarrow P(G') = 1 - P(G) = 1 - 0.6150 = 0.385$

$\Rightarrow P(G') = 0.3850$

Since $P(A) = P(A \cap G) + P(A \cap G')$

$$\Rightarrow P(A \cap G') = P(A) - P(A \cap G) = P(A) - P(G|A) \cdot P(A)$$

$$P(A \cap G') = 0.40 - (0.95) \cdot (0.40) = 0.02$$

then $P(A|G') = \frac{0.02}{0.385} = 0.0519$

$\therefore P(A|G') = 0.0519$ or $\approx 5\%$ is the probability of the product being highly successful given it does not attain a good review.