

sol: let: M = the student failed in math

S = " = " = " = " = Stat.

$M \cap S \Rightarrow MS$ = " = " = " = Stat. & Math

$\therefore$ we have: $P(M) = 0.20$, $P(S) = 0.15$, $P(MS) = 0.05$

$$1 - P(M|S) = \frac{P(MS)}{P(S)} = \frac{0.05}{0.15} = \frac{1}{3}$$

$$P(S|M) = \frac{P(M|S)}{P(M)} = \frac{0.05}{0.20}$$

$$2 - P(S^c|M) = \frac{P(S^c \cap M)}{P(M)} = \frac{P(M) - P(MS)}{P(M)}$$

$$= \frac{0.20 - 0.05}{0.20} = \frac{3}{4} = 0.75$$

$$3 - P(M \cup S) = P(M) + P(S) - P(MS) = 0.20 + 0.15 - 0.05 = 0.30$$

$$4 - P(\overline{M \cup S}) = 1 - P(M \cup S) = 1 - 0.30 = 0.70$$

$$5 - P(M^c|S^c) = \frac{P(M^c \cap S^c)}{P(S^c)} = \frac{P(M \cup S)}{1 - P(S)} = \frac{0.70}{1 - 0.15}$$

$$= \frac{0.70}{0.85} = \frac{14}{17}$$

$$* P(A^c \cap B) = P(B) - P(A \cap B)$$

$$P(S^c \cap M) = P(M) - P(S \cap M)$$

$$P(M)$$

$$P(S^c \cap M) = P((1-S) \cap M) = P(M - SM)$$