$P(A|B)$ means the man is over 6ft in height, knowing that he's a professional basketball player and $P(B|A)$ means the man is a professional basketball player knowing that he's over 6ft in height.

Obviously, $P(A|B) > P(B|A)$. Because most of the basketball player are tall, and among those man who is over 6ft in height, the ratio of professional basketball player is small.

A

50. a. 0.05

b. $0.05 + 0.07 = 0.12$

c. $P(\text{short-sleeved shirt}) = 0.04 + 0.02 + 0.03 + 0.08 + 0.07 + 0.12 + 0.03 + 0.07 + 0.08 = 0.56$

$P(\text{long-sleeved shirt}) = 1 - 0.56 = 0.44$

d. $P(\text{medium}) = 0.08 + 0.07 + 0.12 + 0.1 + 0.05 + 0.07 = 0.39$

$P(\text{print}) = 0.02 + 0.07 + 0.07 + 0.02 + 0.05 + 0.02 = 0.25$

e. $P(\text{medium in short-sleeved plaid}) = \dfrac{0.08}{0.08 + 0.04 + 0.03} = \dfrac{8}{15}$

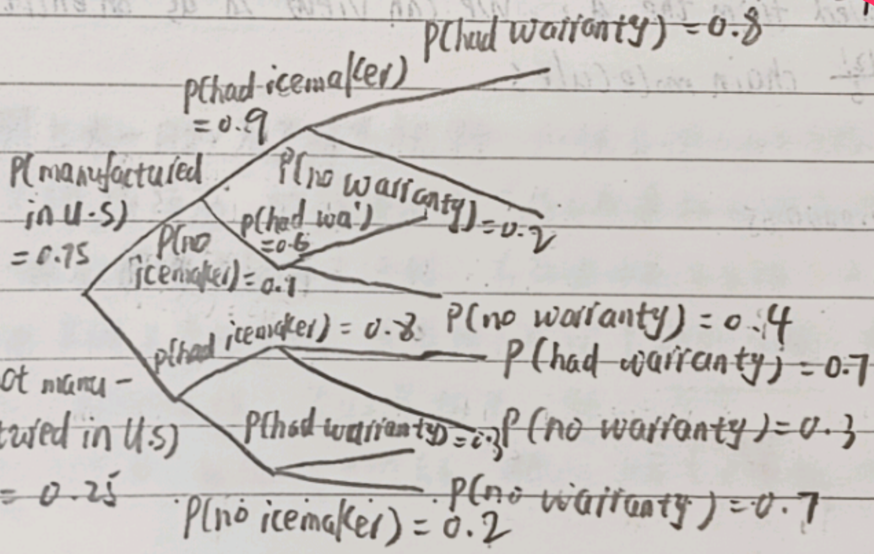
f. $P(\text{short-sleeved and medium}) = \dfrac{0.08}{0.10 + 0.08} = \dfrac{4}{9}$

$P(\text{Long-sleeved and medium}) = \dfrac{0.10}{0.10 + 0.08} = \dfrac{5}{9}$

58. $P(A \cup B | C) = \dfrac{P[(A \cup B) \cap C]}{P(C)} = \dfrac{P[(A \cap C) \cup (B \cap C)]}{P(C)} = \dfrac{P(A \cap C) + P(B \cap C) - P(A \cap B \cap C)}{P(C)}$

$= P(A|C) + P(B|C) - P(A \cap B | C)$.

63. a.



b. $P(A \cap B \cap C) = 0.75 \times 0.9 \times 0.8 = 0.54$

c. $P(B \cap C) = 0.75 \times 0.9 \times 0.8 + 0.8 \times 0.7 \times 0.25 = 0.68$

d. $P(C) = 0.75 \times 0.9 \times 0.8 + 0.75 \times 0.1 \times 0.6 + 0.25 \times 0.8 \times 0.7 + 0.25 \times 0.2 \times 0.3 = 0.74$

e. $P(A | B \cap C) = \dfrac{0.54}{0.68} = 0.794$.

DATE A

2.5 71. a. It's [illegible]. Because they're independent.

b. Let C denotes "At least one of two project will be successful".

$P(C) = P(A')P(B) + P(A)P(B') + P(A)P(B) = 0.6\times0.7 + 0.4\times0.3 + 0.4\times0.7 = 0.82$

c. Let D denotes "only the asain project is successful", we know

$$P(D|C) = \frac{P(D\cap C)}{P(C)} = \frac{0.4\times0.3}{0.82} = \frac{6}{41}$$

72. Since $P(A_1\cap A_2) = 0.11 \neq P(A_1)P(A_2) = 0.055$, So A_1 and A_2 are not independent.

Since $P(A_1\cap A_3) = 0.05 \neq P(A_1)P(A_3) = 0.0616$, So A_1 and A_3 are not independent.

Since $P(A_2\cap A_3) = 0.07 = P(A_2)P(A_3) = 0.07$, So A_2 and A_3 are independent.

78. P(system work) = [P(#1 work) ∪ P(#2 work)] ∪ [P(#3 work) ∩ P(#4 work)]

= [P(#1 work) ∪ P(#2 work)] + [P(#3 work) ∩ P(#4 work)] − {[P(#1 work) ∪ P(#2 work)] ∩ [P(#3 work) ∩ P(#4 work)]}

$= (0.9\times0.9 + 0.9\times0.1\times2) + 0.9\times0.9 - (0.9\times0.9 + 0.9\times0.1\times2)\times(0.9\times0.9) = 0.99 + 0.81 - 0.99\times0.81 = 0.99$[illegible].

84. a. $P = 0.7^3 = 0.343$

b. $P = 1 - 0.7^3 = 0.657$

c. $P = 3\times0.7\times0.3\times0.3 = 0.189$

d. $P = 3\times0.7\times0.3\times0.3 + 0.3^3 = 0.216$

e. P(All passes | at least one of the next three vehicles passes)

$$= \frac{0.343}{1-0.3^3} = 0.353.$$

3.1 4. X may be 0, 1, 2, 3, 4, 5, 6; when X=4, it may be 100000. When X=2, it may be 120000, when X=3, it may be 541000.

5. No. When the sample space is composed by the toss of coin infinite times, let $X = \begin{cases} 0, & \text{the first toss is head} \\ 1, & \text{the first toss is tail} \end{cases}$, so that X is not infinite.

$Y=3$ SSS

$Y=4$ FSSS

$Y=5$ FFSSS, SFSSS

$Y=6$ FFFSSS, SFFSSS, FSFSSS, SSFSSS

$Y=7$ FFFFSSS, SFFFSSS, SSFFSSS, SSSFSSS, SFSFSSS, FSFFSSS, FSSFSSS, FFSFSSS

10. a. Possible values of T: $0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10$

b. Possible values of X: $0, 1, 2, 3, 4, 5, 6; -1, -2, -3, -4$

c. Possible values of U: $0, 1, 2, 3, 4, 5, 6$

d. possible values of Z: $0, 1, 2$.

3.2 12. a. It is $P(Y \le 50) = 0.05 + 0.1 + 0.12 + 0.14 + 0.25 + 0.17 = 0.83$

b. It is $P(Y > 50) = 1 - P(Y \le 50) = 0.17$

c. $P(\text{The first person}) = 0.83 - 0.17 = 0.66$

$P(\text{The third person}) = 0.83 - 0.17 - 0.25 - 0.14 = 0.27$.

23. a. $P(X=2) = 0.39 - 0.19 = 0.2$

b. $P(X > 3) = 1 - 0.67 = 0.33$

c. $P(2 \le X \le 5) = 0.92 - 0.19 = 0.78$

d. $P(2 < X < 5) = 0.92 - 0.39 = 0.53$

25. The possible value of Y is $0, 1, 2, \ldots$

When $Y=0$, $P(Y=0) = p$

When $Y=1$, $P(Y=1) = (1-p)p$

When $Y=2$, $P(Y=2) = (1-p)^2 p$

...

So the pmf of Y is $P(Y=k) = (1-p)^k p$ for all possible y.