HW3 参考解答

2.81 Consider the events:
H: husband watches a certain show,
W: wife watches the same show.

(a) $P(W \cap H) = P(W)P(H \mid W) = (0.5)(0.7) = 0.35.$

(b) $P(W \mid H) = \frac{P(W \cap H)}{P(H)} = \frac{0.35}{0.4} = 0.875.$

(c) $P(W \cup H) = P(W) + P(H) - P(W \cap H) = 0.5 + 0.4 - 0.35 = 0.55.$

2.93 This is a parallel system of two series subsystems.

(a) $P = 1 - [1 - (0.7)(0.7)][1 - (0.8)(0.8)(0.8)] = 0.75112.$

(b) $P = \frac{P(A' \cap C \cap D \cap E)}{P\text{system works}} = \frac{(0.3)(0.8)(0.8)(0.8)}{0.75112} = 0.2045.$

2.100 Consider the events
E: a malfunction by other human errors,
A: station A, B: station B, and C: station C.
$P(C \mid E) = \frac{P(E \mid C)P(C)}{P(E \mid A)P(A)+P(E \mid B)P(B)+P(E \mid C)P(C)} = \frac{(5/10)(10/43)}{(7/18)(18/43)+(7/15)(15/43)+(5/10)(10/43)} = \frac{0.1163}{0.4419} = 0.2632.$