

2.53) $A: \text{Shanghai}$ $P(A) = 0,7$
 $B: \text{Beijing}$ $P(B) = 0,4$
 $P(A \cup B) = 0,8$

a) $P(A \cap B) = P(A) + P(B) - P(A \cup B)$
 $= 0,7 + 0,4 - 0,8$
 $= \underline{\underline{0,3}}$

b) $P(A' \cap B') = 1 - P(A \cup B)$
 $= 1 - 0,8$
 $= \underline{\underline{0,2}}$

2.63) $A: \text{Adult Bedroom}$ $P(A) = 0,03$
 $B: \text{Child Bedroom}$ $P(B) = 0,15$
 $C: \text{Other Bedroom}$ $P(C) = 0,14$
 $D: \text{Office or den}$ $P(D) = 0,40$
 $E: \text{Other rooms}$ $P(E) = 0,28$

a) $P(\text{Bedroom}) = P(A) + P(B) + P(C)$
 $= 0,03 + 0,15 + 0,14$
 $= \underline{\underline{0,32}}$

b) $P(\text{Bedroom}') = 1 - P(\text{Bedroom})$
 $= 1 - 0,32$
 $= \underline{\underline{0,68}}$

c) $\underline{\underline{\text{Office or den}}}$

2.79)

	Male	Female	Total
Underwear	0.220	0.024	0.244
Nightgown	0.002	0.180	0.182
Nothing	0.160	0.018	0.178
Pajamas	0.102	0.073	0.175
T-shirt	0.046	0.088	0.134
Other	0.084	0.003	0.087

a) $P(\text{Female} \cap \text{Nothing}) = \underline{\underline{0,018}}$

$$b) P(\text{Male}) = 0,220 + 0,002 + 0,160 + 0,102 + 0,046 + 0,084$$

$$= \underline{\underline{0,614}}$$

$$c) P(\text{Pajamas} | \text{Male}) = \frac{P(\text{Pajamas} \cap \text{Male})}{P(\text{Male})}$$

$$= \frac{0,102}{0,614}$$

$$= \underline{\underline{0,166}}$$

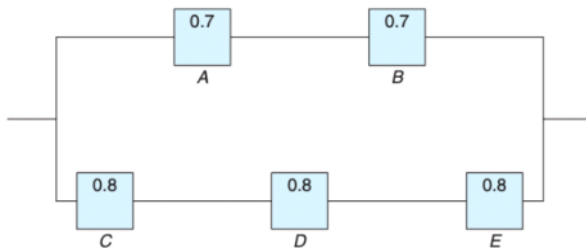
$$d) P(\text{Male} | (\text{Pajamas} \cup \text{T-Shirt})) = \frac{P((\text{Pajamas} \cup \text{T-Shirt}) \cap \text{Male})}{P(\text{Pajamas} \cup \text{T-Shirt})}$$

$$= \frac{P(\text{Male} \cap \text{Pajamas}) + P(\text{Male} \cap \text{T-Shirt})}{P(\text{Pajamas}) + P(\text{T-Shirt})}$$

$$= \frac{0,102 + 0,046}{0,175 + 0,134}$$

$$= \underline{\underline{0,479}}$$

2.93)



$$a) P(A \cap B) = (0,7) \cdot (0,7) = 0,49$$

$$P(C \cap D \cap E) = (0,8)(0,8)(0,8) = 0,512$$

$$P_{\text{system}} = 1 - P(\text{System}') \\ = 1 - (1 - P(A \cap B))(1 - P(C \cap D \cap E)) \\ = 1 - (1 - 0,49)(1 - 0,512) \\ = \underline{\underline{0,75112}}$$

$$b) P((A' \cap C \cap D \cap E) | \text{system}) = \frac{P(A' \cap C \cap D \cap E)}{P_{\text{system}}}$$

$$= \frac{(0,3)(0,8)(0,8)(0,8)}{0,75112}$$

$$= \underline{\underline{0,204}}$$

2.95) A : Adult selected has cancer
 B : Adult diagnosed having cancer

$$P(A) = 0,05$$

$$P(B|A) = 0,78$$

$$P(B|A') = 0,06$$

$$P(A') = 1 - P(A)$$

$$= 0,95$$

$$P(A \cap B) = P(B|A) \cdot P(A)$$

$$P(A' \cap B) = P(B|A') \cdot P(A')$$

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

$$= P(B|A) \cdot P(A) + P(B|A') \cdot P(A')$$

$$= (0,78)(0,05) + (0,06)(0,95)$$

$$= \underline{\underline{0,096}}$$

2.101) A : purchases latex paint
 A' : purchases semigloss paint
 B : purchases rollers

$$P(A) = 0,75$$

$$P(A') = 0,25$$

$$P(B|A) = 0,60$$

$$P(B|A') = 0,30$$

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

$$= \frac{P(A \cap B)}{P(B \cap (A \cup A'))}$$

$$= \frac{P(A \cap B)}{P(B \cap A) + P(B \cap A')}$$

$$= \frac{0,45}{0,45 + 0,075}$$

$$= \underline{\underline{0,857}}$$

$$P(B|A) = \frac{P(A \cap B)}{P(A)}$$

$$P(A \cap B) = P(B|A) P(A)$$

$$= (0,60)(0,75)$$

$$P(A \cap B) = 0,45$$

$$P(B|A') = \frac{P(A' \cap B)}{P(A')}$$

$$P(A' \cap B) = P(B|A') P(A')$$

$$= (0,30)(0,25)$$

$$P(A' \cap B) = 0,075$$