

Chapter 3 Homework Solutions

Section 3.1

1. $P(A) = 865/1348 = 0.642 = 64.2\%$
3. $P(A \& B) = 0$
5. $P(A \& D) = 479/1349 = 0.355 = 35.5\%$
7. $P(\text{Correct Guess}) = 1/5 = 0.200 = 20.0\%$
9. $P(\text{On Time}) = 278/300 = 0.927 = 92.7\%$. If 278 arrivals were on time, then $300 - 278 = 22$ arrivals were late. $P(\text{Late}) = 22/300 = 0.0733 = 7.33\%$.

Section 3.2

1. $P(A) = 130/165 = 0.788 = 78.8\%$
3. $P(C) = 36/165 = 0.218 = 21.8\%$
5. $P(A \& B) = 0$
7. $P(A \& C) = 29/165 = 0.176 = 17.6\%$
9. $P(C|A) = 29/130 = 0.223 = 22.3\%$.
11. $P(B \& D) = 28/165 = 0.170 = 17.0\%$
13. $P(D|B) = 28/35 = 0.800 = 80.0\%$
15. $P(\bar{A}) = 1 - P(A) = 1 - 130/165 = 0.212 = 21.2\%$.
17. $P(A \& C) = 29/165 = 17.6\%$
 $P(A) \cdot P(C) = (130/165) \cdot (36/165) = 0.788 \cdot 0.218 = 0.172 = 17.2\%$
The answers are slightly different, so they events are not independent, but they are close to being so!
19. $P(A \text{ or } B) = P(A) + P(B) = (4/52) + (4/52) = 8/52 = 15.4\%$.
21. $P(A \text{ or } C) = P(A) + P(C) - P(A \& C) = (4/52) + (13/52) - 1/52 = 16/52 = 0.308 = 30.8\%$
23. $P(A \& B) = P(A) \cdot P(B) = (4/52) \cdot (4/52) = 0.00592 = 0.592\%$.

The sample space for problems 25 – 29 is:

GGG,BGG,GBG,GGB,GBB,BGB,BBG,BBB; a total of 8 possible outcomes.

25. $P(\text{no girls}) = 1/8$ since this can happen in only one way.
27. $P(\text{two girls}) = 3/8$ since this can happen in three ways.
29. $P(\text{at least one}) = 1 - P(\text{none}) = 1 - 1/8 = 7/8 = 0.875 = 87.5\%$.
31. $P(\text{ring}) = 0.95$, $P(\text{fail}) = 0.05$, so...
 $P(\text{fail} \& \text{fail} \& \text{fail}) = (0.05) \cdot (0.05) \cdot (0.05) = 0.000125$.
33. $P(\text{female} \& \text{female} \& \text{female}) = (0.498) \cdot (0.498) \cdot (0.498) = 0.124 = 12.4\%$.
35. The probability of guessing a number correctly is $1/50$. To guess correctly three times, we multiply: $P(\text{correct} \& \text{correct} \& \text{correct}) = (1/50) \cdot (1/50) \cdot (1/50) = 0.000008$