

Assignment 1: Answers

1. (a) $(A \cap B^c) \cup (A^c \cap B)$
 (b) $(A \cap B) \cup (B \cap C) \cup (C \cap A)$
 (c) $(A \cap B^c \cap C^c) \cup (A^c \cap B \cap C^c) \cup (A^c \cap B^c \cap C) \cup (A^c \cap B^c \cap C^c)$
 (d) $A \cap C \cap B^c$
 (e) $(A \cap C) \cup B$
 (f) $A^c \cap B^c \cap C^c$
2. (a) $\frac{3}{10}$
 (b) $\frac{3}{10} + \frac{3}{25} - \frac{9}{250}$
 (c) $\frac{9}{250}$
 (d) $\frac{9}{250} + \frac{1}{2} - \frac{3}{250}$
3. (a) $\binom{6}{2} \times \binom{6}{1} \times \binom{8}{1} + \binom{6}{1} \times \binom{6}{2} \times \binom{8}{1} + \binom{6}{1} \times \binom{6}{1} \times \binom{8}{2} = 2448$
 (b) $\frac{2}{9}$
 (c) $\frac{1}{\binom{8}{2}} \cdot \frac{1}{3} = \frac{1}{84}$
 (d) $\frac{1}{3} \cdot \frac{5}{6} \cdot \frac{7}{8} = \frac{35}{144}$
 (e) $\frac{1}{4}$
4. (a) 0.27
 (b) 0
 (c) 0.34
 (d) $\frac{0.18}{0.52} = \frac{9}{26}$
 (e) $\frac{0.45}{0.9} = \frac{1}{2}$
5. (a) $\frac{1}{2^n}$
 (b) If n is odd: 0
 If n is even: $\binom{n}{n/2} \cdot \frac{1}{2^n}$
 (c) $\frac{\binom{n}{3}}{2^n}$
 (d) $1 - \frac{1}{2^n} - \frac{n}{2^n}$
6. (a) $\frac{\binom{6}{2} \times \binom{4}{2} \times 4! \times 4! \times 4!}{12!}$
 (b) $\frac{\binom{6}{2} \times 3 \times 4! \times 2^4 \times 4! \times 4!}{12!} = \frac{8}{385}$
 (c) $\frac{\binom{6}{4} \times \binom{4}{2} \times 2^6 \times 4! \times 4! \times 4!}{12!} = \frac{64}{385}$
 (d) $\frac{1}{3}$
7. See solution to Problem 12 in BT Chapter 1.
8. See solution to Problem 13 in BT Chapter 1.