



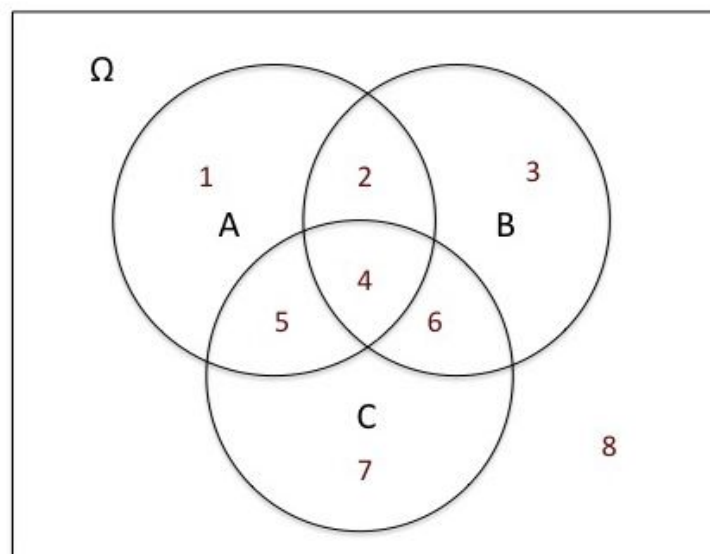
课程 > Unit 1: ... > Proble... > 1. Ven...

1. Venn diagrams

Problem 1. Venn diagrams

5.0/5.0 points (graded)

In this problem, you are given descriptions in words of certain events (e.g., "at least one of the events A, B, C occurs"). For each one of these descriptions, identify the correct symbolic description in terms of A, B, C from Events E1-E7 below. Also identify the correct description in terms of regions (i.e., subsets of the sample space Ω) as depicted in the Venn diagram below. (For example, Region 1 is the part of A outside of B and C .)



Symbolic descriptions:

- Event E1: $A \cap B \cap C$
- Event E2: $(A \cap B \cap C)^c$
- Event E3: $A \cap B \cap C^c$



- Event E4: $B \cup (B^c \cap C^c)$
- Event E5: $A^c \cap B^c \cap C^c$
- Event E6: $(A \cap B) \cup (A \cap C) \cup (B \cap C)$
- Event E7: $(A \cap B^c \cap C^c) \cup (A^c \cap B \cap C^c) \cup (A^c \cap B^c \cap C)$

1. At least two of the events A, B, C occur.

Event E6 ▼ ✓ Answer: Event E6

Regions: 2 4 5 6 ▼ ✓ Answer: Regions: 2 4 5 6

2. At most two of the events A, B, C occur.

Event E2 ▼ ✓ Answer: Event E2

Regions: 1 2 3 5 6 7 8 ▼ ✓ Answer: Regions: 1 2 3 5 6 7 8

3. None of the events A, B, C occurs.

Event E5 ▼ ✓ Answer: Event E5

Region: 8 ▼ ✓ Answer: Region: 8

4. All three events A, B, C occur.

Event E1 ▼ ✓ Answer: Event E1

Region: 4 ▼ ✓ Answer: Region: 4

5. Exactly one of the events A, B, C occurs.

Event E7 ▼ ✓ Answer: Event E7

Regions: 1 3 7 ▼ ✓ Answer: Regions: 1 3 7

6. Events A and B occur, but C does not occur.

Event E3 ▼ ✓ Answer: Event E3

Region: 2 ▼

✓ Answer: Region: 2

7. Either (i) event B occurs, or (ii) neither B or C occurs.

Event E4 ▼

✓ Answer: Event E4

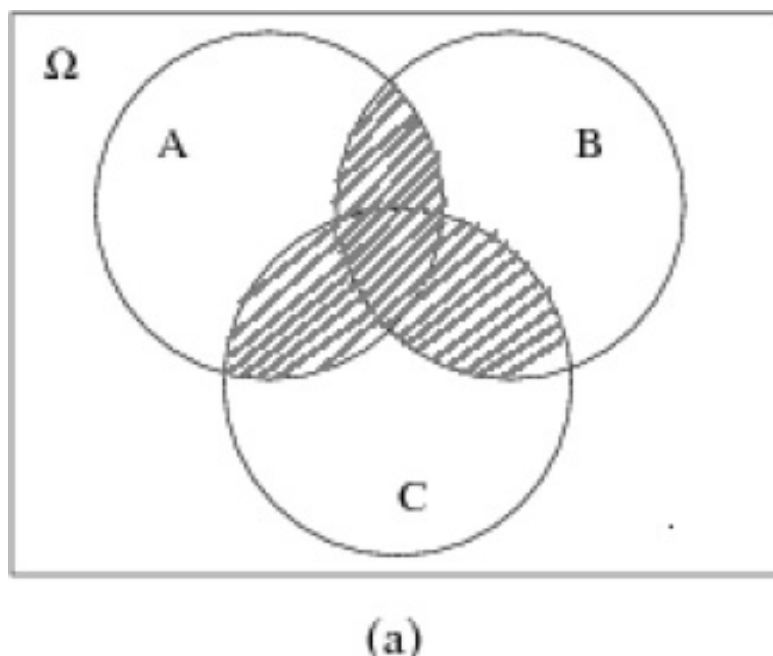
Regions: 1 2 3 4 6 8 ▼

✓ Answer: Regions: 1 2 3 4 6 8

Solution:

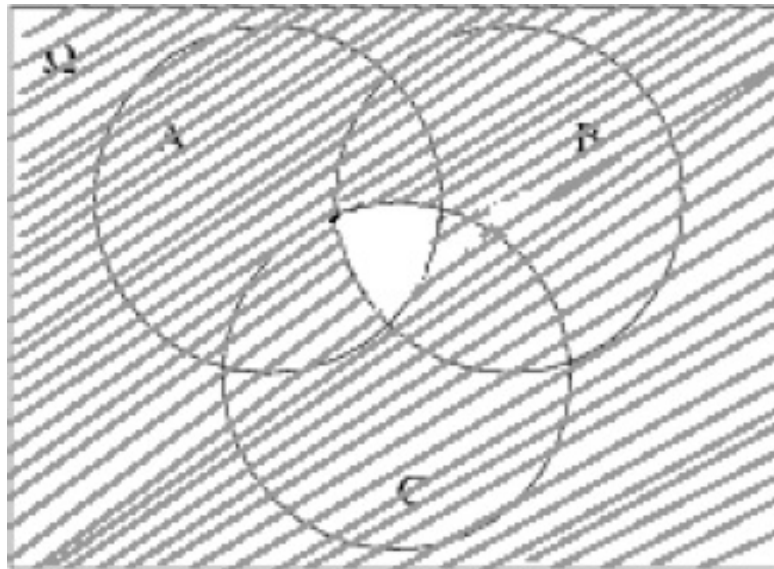
1. At least two of the events A, B, C occur:

$$(A \cap B) \cup (A \cap C) \cup (B \cap C)$$



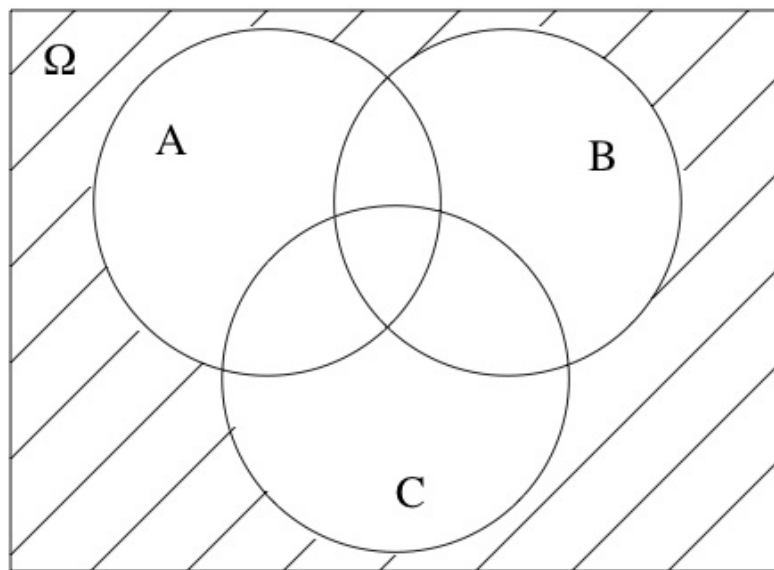
2. At most two of the events A, B, C occur:

$$(A \cap B \cap C)^c$$



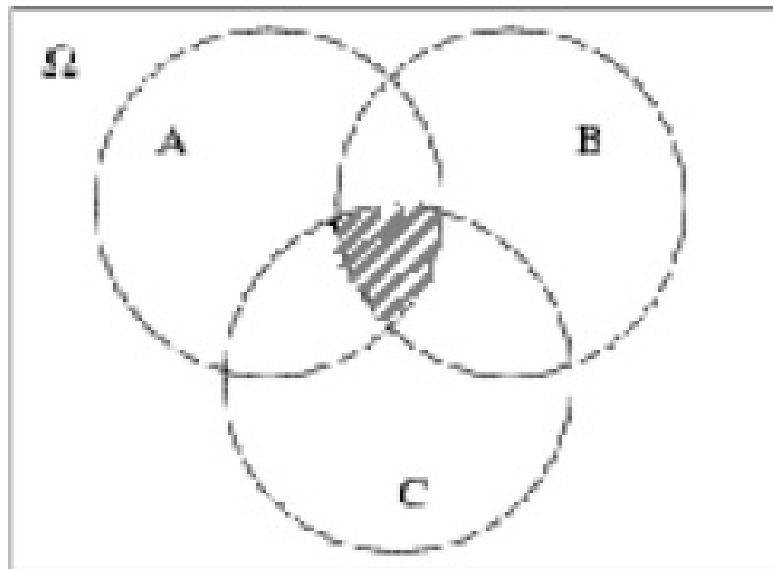
(b)

3. None of the events A, B, C occurs:
 $A^c \cap B^c \cap C^c$



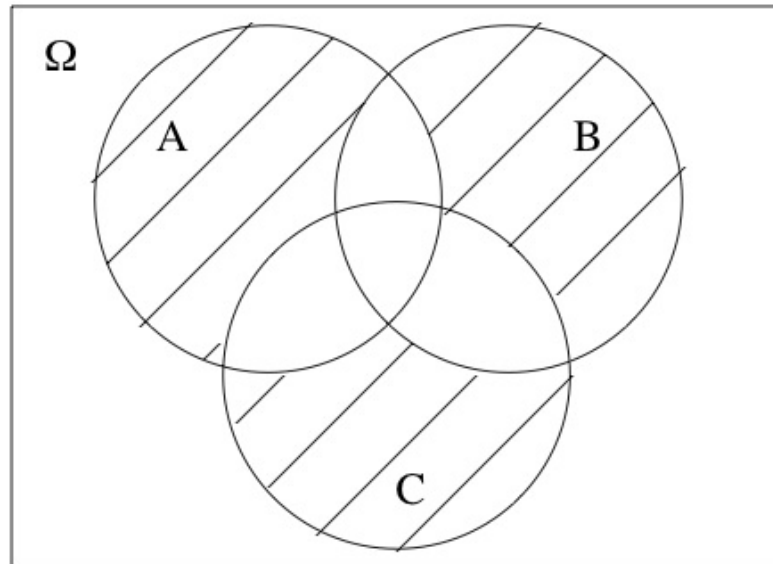
(c)

4. All three events A, B, C occur:
 $A \cap B \cap C$



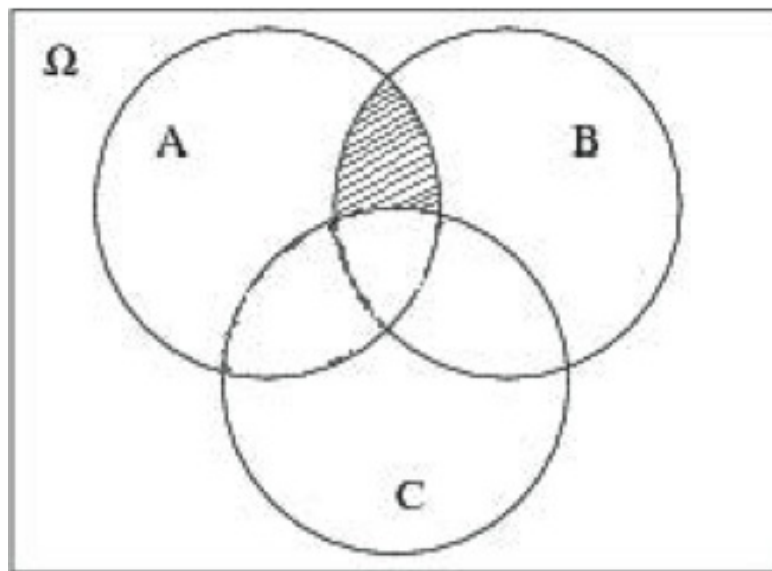
(d)

5. Exactly one of the events A, B, C occurs:
 $(A \cap B^c \cap C^c) \cup (A^c \cap B \cap C^c) \cup (A^c \cap B^c \cap C)$



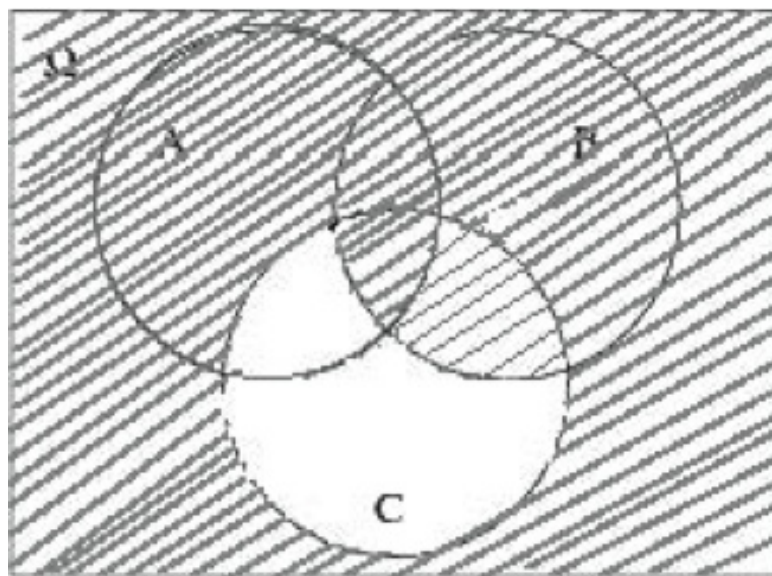
(e)

6. Events A and B occur, but C does not occur:
 $A \cap B \cap C^c$



(f)

7. Either event B occurs or, if not, then C also does not occur:
 $B \cup (B^c \cap C^c)$



(g)

提交

You have used 1 of 3 attempts



Answers are displayed within the problem

讨论

Topic: Unit 1 / Problem Set / 1. Venn diagrams

显示讨论

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