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[Mathematical background: Sets; sequences, limits, and series; \(un\)countable sets.](#)

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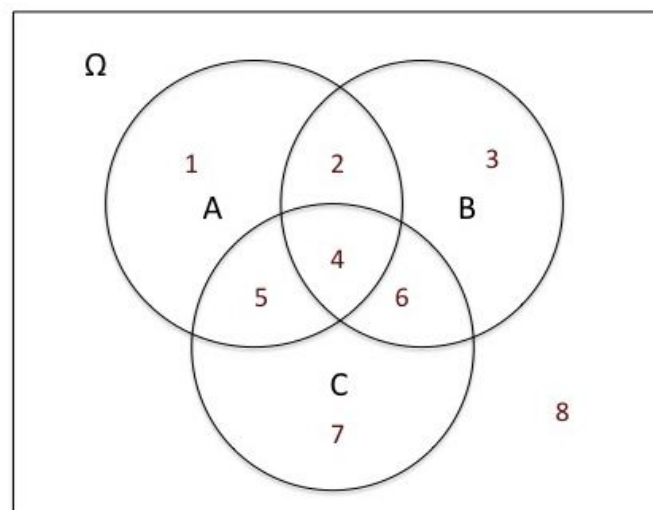
Problem 1 Vertical: Venn diagrams

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Problem 1: Venn diagrams

5/5 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 ✓

Regions: 2 4 5 6 ✓

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

Event E2 ✓

Regions: 1 2 3 5 6 7 8 ✓

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

Event E5 ✓

Region: 8 ✓

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

Event E1 ✓

Region: 4 ✓

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

Event E7 ✓

Regions: 1 3 7 ✓

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

Event E3 ✓

Region: 2 ✓

7. Either event B occurs or, if not, then C also does not occur.

Event E4 ✓

Regions: 1 2 3 4 6 8 ✓

Submit

You have used 2 of 3 attempts

✓ Correct (5/5 points)

Printable problem set available here .

DISCUSSION

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Discussion

Topic: Unit 1/Problem Set 1 / Venn diagrams

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