

## Quiz 5A

Name: **Answer Key**

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Closed book/notes. Scientific calculators only. For questions 3 and 4, all steps must be shown to receive full credit.

1. (1 pt.) Suppose events  $A$  and  $B$  are disjoint. Which of the following is true?

- (a)  $P(A \cup B) = P(A) + P(B)$   
 (b)  $P(A \cup B) = P(A)P(B)$   
 (c)  $P(A \cap B) = P(A) + P(B)$   
 (d)  $P(A \cap B) = P(A)P(B)$

2. (1 pt.) Suppose events  $A$  and  $B$  are independent. Which of the following is true?

- (a)  $P(A \cup B) = P(A) + P(B)$   
 (b)  $P(A \cup B) = P(A)P(B)$   
 (c)  $P(A \cap B) = P(A) + P(B)$   
 (d)  $P(A \cap B) = P(A)P(B)$

**Questions 3-5 are based on the following. Suppose events  $A$ ,  $B$ ,  $C$ , and  $D$  are mutually exclusive with  $P(A) = 0.1$ ,  $P(B) = 0.3$ ,  $P(C) = 0.2$ , and  $P(D) = 0.3$ . For questions 3 and 4, award one point for each step being shown.**

3. (3 pts.) Compute  $P(A \cup B)$ .

$$P(A \cup B) = P(A) + P(B) \quad (1)$$

$$= 0.1 + 0.3 \quad (2)$$

$$= 0.4 \quad (3)$$

4. (4 pts.) Compute  $P((A \cup B \cup C \cup D)^C)$ .

$$P((A \cup B \cup C \cup D)^C) = 1 - P(A \cup B \cup C \cup D) \quad (4)$$

$$= 1 - (P(A) + P(B) + P(C) + P(D)) \quad (5)$$

$$= 1 - (0.1 + 0.3 + 0.2 + 0.3) \quad (6)$$

$$= 0.1 \quad (7)$$

5. (1 pt.) Based on your answer to the previous question, does the sample space equal the union of all four events?

Yes

No

Grade: /10