

Lesson 1.2- Addition Rule Of Probability

Mathematics- 11 Innovators (26-27)

Name: _____ Date: _____ Class: _____

Directions:

- Answer all multiple-choice questions by circling **A, B, C, or D**.
- For Grid-In items, **show work** in the space provided and write your final answer clearly.

Multiple-Choice (1–10)

Question 1: Let A and B be any two events. Which of the following statements is correct?

- A. $P(A \cup B) = P(A) + P(B)$.
- B. $P(A \cup B) = P(A) + P(B) - P(A \cap B)$.
- C. $P(A \cup B) = P(A) - P(B)$.
- D. $P(A \cup B) = P(A) + P(B) + P(A \cap B)$.

Question 2: Let A and B be two mutually exclusive events. Which statement is incorrect?

- A. $P(A \cup B) = P(A) + P(B)$.
- B. $P(A \cup B) = P(A)P(B)$.
- C. $P(A \cup B) = P(A) + P(B) - P(A \cap B)$.
- D. $P(A \cap B) = 0$.

Question 3: Let A and B be two events. Given $P(A) = 1/3$, $P(B) = 7/8$, $P(A \cap B) = 5/24$, what type of event is $A \cup B$?

- A. Probability $1/4$.
- B. A certain event.
- C. An impossible event.
- D. Probability $1/8$.

Question 4: Let A and B be mutually exclusive events. Given $P(A)=1/5$ and $P(B)=1/3$, find $P(A \cup B)$.

- A. $3/5$
- B. $8/15$
- C. $2/15$
- D. $1/15$

Question 5: Let A be an event and $\bar{A}$ its complement. Which statement is incorrect?

- A. $A \cap \bar{A} = \emptyset$.
- B. $P(A \cap \bar{A}) = 1$.
- C. $P(A \cup \bar{A}) = P(A) + P(\bar{A})$.
- D. $P(A \cup \bar{A}) = 1$.

Question 6: Class 11A8 has 25 male and 20 female students. Two students are chosen at random to attend a school meeting. Find the probability that both selected students are of the same gender.

- A. $19/99$
- B. $10/33$
- C. $49/99$
- D. $29/99$

Question 7: A fair six-sided die is rolled twice. Find the probability that the number 6 appears at least once.

- A. $19/99$
- B. $10/33$
- C. $11/36$
- D. $29/99$

Question 8: A fair coin is tossed five times. Find the probability that the heads face appears at least once.

- A. $19/99$
- B. $10/33$
- C. $31/32$
- D. $29/99$

Question 9: A two-digit positive integer is chosen at random. Find the probability that it is divisible by 9 or 15.

- A. $1/10$
- B. $1/15$
- C. $1/6$
- D. $13/45$

Question 10: Let X be the set of all three-digit numbers formed by three distinct digits chosen from 1 to 9. What is the probability that a randomly selected number from X has a product of its digits that is either a perfect square or an odd number?

- A. $5/42$
- B. $5/28$
- C. $5/14$
- D. $5/21$

Grid-In (Write your final answers)

1. A volunteer team consists of 9 Grade 10 students and 7 Grade 11 students. Three students are randomly selected from the team. Find the probability that all three selected students are from the same grade.

2. Let A and B be mutually exclusive events. Given

$$P(A) = \frac{3}{5}, P(B) = \frac{1}{5},$$

find $P(A \cup B)$.

3. A high school has 8 outstanding Grade 10 students, 10 outstanding Grade 11 students, and 12 outstanding Grade 12 students.

Four students are selected at random to represent the school in a flag-raising ceremony.

What is the probability that the selected group includes students from all three grade levels?

4. A regular 20-gon (H) has 20 vertices. Three vertices are chosen at random.

Let event A be: "*The three selected vertices form a right triangle with none of its sides being a side of (H) .*"

Let event B be: "*The three selected vertices form a triangle with exactly one side being a side of (H) .*"

Find $P(A \cup B)$.

5. At an international conference, there are **50 scientists**, among whom:

31 speak English, 21 speak French, 5 speak both English and French. One scientist is selected at random.

What is the probability that the selected scientist speaks **at least one** of the two languages, English or French?

6. A bookstore sells two books, A and B .

It is known that: 70% of customers buy book A ; 50% buy book B ; 90% buy at least one of the two books. Find the probability that a customer buys **both** books A and B .