

Probability — Assignment 1

Class 11 Maths · Topic-wise question bank covering every concept of the chapter · Narayan Gurukul Academy

Instructions: (1) Attempt all questions. This worksheet walks through every concept of the chapter, topic by topic.
 (2) The interactive MCQ version of these questions (with instant answer reveal) is available on the notes page.
 (3) Universal values: $g = 10 \text{ m/s}^2$ unless stated. Give answers with correct SI units.

Random Experiments and Outcomes

MCQ Questions (choose the correct option)

1. A random experiment is one whose outcomes
 - (A) cannot be predicted with certainty
 - (B) are always known in advance
 - (C) have no sample space
 - (D) are all equally likely
2. The set of all possible outcomes of a random experiment is called the
 - (A) sample space
 - (B) event
 - (C) probability
 - (D) complement
3. Rolling a die is an example of
 - (A) a random experiment
 - (B) a deterministic experiment
 - (C) an event
 - (D) a complement
4. An outcome is
 - (A) a possible result of a random experiment
 - (B) the sample space
 - (C) an event with probability 1
 - (D) always impossible

1 Mark Questions

1. Define a random experiment.
2. Define an outcome.
3. Give one example of a random experiment.

2 Mark Questions

1. Write the sample space when a coin is tossed twice.
2. Write the sample space when a die is rolled once.

3 Mark Questions

1. Write the sample space for the experiment of tossing a coin three times and count the number of outcomes.
2. Two dice are rolled. Write the sample space and find the number of outcomes where the sum is 7.

Sample Space and Events

MCQ Questions (choose the correct option)

- An event is a
 - subset of the sample space
 - the whole sample space only
 - an outcome
 - a random experiment
- The sample space when a die is rolled is
 - {1, 2, 3, 4, 5, 6}
 - {0, 1}
 - {H, T}
 - {1, 2}
- The number of outcomes when a coin is tossed twice is
 - 4
 - 2
 - 1
 - 8
- An event consisting of a single outcome is called
 - an elementary event
 - a compound event
 - a sure event
 - an impossible event

1 Mark Questions

- What is an event?
- Write the sample space when a die is rolled once.
- What is an elementary event?

2 Mark Questions

- An event A is 'getting a prime number' when a die is rolled. List the outcomes of A.
- Write the sample space for tossing a coin and rolling a die together.

3 Mark Questions

- For the experiment of rolling a die, list the event 'getting an even number' and the event 'getting a number greater than 4'.
- Two coins are tossed. List all events and find the event of getting exactly one head.

Types of Events

MCQ Questions (choose the correct option)

- A sure (certain) event has probability
 - 1
 - 0
 - $\frac{1}{2}$
 - undefined
- An impossible event has probability

- (A) 0
 - (B) 1
 - (C) $1/2$
 - (D) ∞
3. A compound event is
- (A) an event with more than one outcome
 - (B) an event with one outcome
 - (C) a sure event
 - (D) an impossible event
4. The event 'getting a number greater than 6' when a die is rolled is
- (A) impossible
 - (B) sure
 - (C) elementary
 - (D) compound

1 Mark Questions

1. What is a sure event? What is its probability?
2. What is an impossible event? What is its probability?
3. Define a compound event.

2 Mark Questions

1. Give an example of a sure event when a die is rolled.
2. Give an example of an impossible event when a die is rolled.

3 Mark Questions

1. Classify the following as sure, impossible or compound: getting a number less than 7; getting 8; getting an even number, when a die is rolled.
2. Two dice are rolled. Describe the event 'the sum is a prime number' and state its type.

Axioms of Probability

MCQ Questions (choose the correct option)

1. For any event A, $0 \leq P(A) \leq$
 - (A) 1
 - (B) 2
 - (C) ∞
 - (D) 0.5
2. $P(S)$, where S is the sample space, equals
 - (A) 1
 - (B) 0
 - (C) $1/2$
 - (D) n
3. If A and B are mutually exclusive, then $P(A \cup B) =$
 - (A) $P(A) + P(B)$
 - (B) $P(A)P(B)$

- (C) $P(A) - P(B)$
 (D) $P(A)/P(B)$
4. The probability of an event lies between
 (A) 0 and 1
 (B) -1 and 1
 (C) 0 and ∞
 (D) 1 and 2

1 Mark Questions

1. State the range of $P(A)$.
2. What is $P(S)$ for the sample space S ?
3. Write the addition rule for mutually exclusive events.

2 Mark Questions

1. If $P(A) = 0.4$, find $P(A')$.
2. If A and B are mutually exclusive with $P(A) = 0.3$ and $P(B) = 0.4$, find $P(A \cap B)$.

3 Mark Questions

1. If $P(A) = 0.5$, $P(B) = 0.4$ and $P(A \cap B) = 0.2$, find $P(A \cup B)$.
2. State and explain the axioms of probability with an example.

Complementary Events and the Addition Theorem

MCQ Questions (choose the correct option)

1. For an event A , $P(A) + P(A')$ equals
 (A) 1
 (B) 0
 (C) 2
 (D) undefined
2. The event 'not A ' is called the
 (A) complement of A
 (B) union of A
 (C) intersection of A
 (D) sample space
3. The addition theorem states $P(A \cup B) =$
 (A) $P(A) + P(B) - P(A \cap B)$
 (B) $P(A) + P(B)$
 (C) $P(A)P(B)$
 (D) $P(A) - P(B)$
4. If $P(A) = 0.6$, then $P(A')$, where A' is the complement, is
 (A) 0.4
 (B) 0.6
 (C) 1.6
 (D) 0

1 Mark Questions

1. Write the relation between $P(A)$ and $P(A')$.
2. State the general addition theorem.
3. If $P(A) = 0.6$, find $P(A')$.

2 Mark Questions

1. If $P(A) = 0.35$, find $P(\text{not } A)$.
2. If $P(A \cap B) = 0.7$, $P(A) = 0.4$ and $P(B) = 0.5$, find $P(A \cup B)$.

3 Mark Questions

1. If $P(A) = 0.5$, $P(B) = 0.6$ and $P(A \cap B) = 0.3$, find $P(A \cup B)$ and $P(A' \cap B')$.
2. Prove that $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ using the axioms of probability.

Mutually Exclusive Events

MCQ Questions (choose the correct option)

1. Two events A and B are mutually exclusive if
 - (A) $A \cap B = \emptyset$
 - (B) $A \cup B = S$
 - (C) $A = B$
 - (D) $A \cap B = S$
2. For mutually exclusive events, $P(A \cap B)$ equals
 - (A) 0
 - (B) 1
 - (C) $P(A)P(B)$
 - (D) $P(A) + P(B)$
3. The events 'getting a head' and 'getting a tail' on one coin toss are
 - (A) mutually exclusive
 - (B) not mutually exclusive
 - (C) identical
 - (D) compound
4. If A and B are mutually exclusive, then $P(A \cup B) =$
 - (A) $P(A) + P(B)$
 - (B) $P(A)P(B)$
 - (C) $P(A) - P(B)$
 - (D) $P(A)/P(B)$

1 Mark Questions

1. Define mutually exclusive events.
2. What is $P(A \cap B)$ for mutually exclusive events?
3. Write $P(A \cup B)$ for mutually exclusive events A and B.

2 Mark Questions

1. When a die is rolled, are 'getting an even number' and 'getting an odd number' mutually exclusive?
2. If $P(A) = 0.3$ and $P(B) = 0.5$ with A, B mutually exclusive, find $P(A \cup B)$.

3 Mark Questions

1. When a die is rolled, find the probability of getting an even number or a number greater than 4.
2. Two dice are rolled. Find the probability that the sum is 6 or 8, treating these as mutually exclusive events.

Odds in Favour and Against

MCQ Questions (choose the correct option)

1. If odds in favour of an event are $m : n$, then $P(\text{event})$ is
 - (A) $m/(m + n)$
 - (B) $n/(m + n)$
 - (C) m/n
 - (D) n/m
2. If odds against an event are $m : n$, then $P(\text{event})$ is
 - (A) $n/(m + n)$
 - (B) $m/(m + n)$
 - (C) m/n
 - (D) n/m
3. If $P(A) = 3/5$, the odds in favour of A are
 - (A) 3 : 2
 - (B) 2 : 3
 - (C) 3 : 5
 - (D) 5 : 3
4. If $P(A) = 1/4$, the odds against A are
 - (A) 3 : 1
 - (B) 1 : 3
 - (C) 1 : 4
 - (D) 4 : 1

1 Mark Questions

1. If odds in favour of A are $m : n$, write $P(A)$.
2. If odds against A are $m : n$, write $P(A)$.
3. If $P(A) = 3/5$, find the odds in favour of A.

2 Mark Questions

1. If $P(A) = 1/4$, find the odds against A.
2. The odds in favour of an event are 2 : 3. Find the probability of the event.

3 Mark Questions

1. The odds against an event are 5 : 2. Find the probability of its occurrence.
2. If the odds in favour of an event are 7 : 5, find the probability of the event and of its complement.