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Probability – Aptitude Questions and Answers

1.Three unbiased coins are tossed. What is the probability that at most one had occurred?

Solution:

S = {HHH, HHT, HTH, THH, HTT, THT, TTH, TTT}
Favorable outcomes = {HTT, THT, TTH, TTT}
Total number of outcomes = 8
Number of favorable outcomes = 4
Required probability = 4 / 8 = 0.50

2: Find the probability of getting a red card when a card is drawn from a well-shuffled pack of cards.

Solution:

Total number of outcomes = 52
Number of favorable outcomes = Number of red cards = 26
Required probability = 26 / 52 = 0.50

3: A bag contains 6 white and 4 black balls. Two balls are drawn at random from the bag. Find the probability that both the balls are of the same color.

Solution:

Outcome will be favorable if the two balls drawn are of the same color. => Number of favorable outcomes = 6C2 + 4C2 = 21
Total number of outcomes = 10C2 = 45
Therefore, required probability = 21 / 45 = 7 / 15

4: An unbiased die is tossed. Find the probability of getting an even number.

Solution:

S = {1, 2, 3, 4, 5, 6}
Favorable outcomes = {2, 4, 6}
Required probability = 3 / 6 = 0.50

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5: From a bag containing red and blue balls, 10 each, 2 balls are drawn at random. Find the probability that one of them is red and the other is blue.

Solution:

Total number of outcomes = 20C2 = 190
Number of favorable outcomes = 10C1 x 10C1 = 100
Therefore, required probability = 100 / 190 = 10 / 19

MCQs on Probability

1: A card is drawn from the set of 52 cards. Find the probability of getting a queen card.

A. 1/52
B. 1
C. 1/26
D. 1/13

Answer: D
Solution:

Number of favorable outcomes = 4 (since there are 4 queens in the deck)
Total number of possible outcomes = 52 (since there are 52 cards in total)

Thus, the probability of drawing a queen card is:
P(Queen) = 4/52 = 1/13

2: If a coin is thrown two times, what is the probability that at least one tail is obtained?

A) 3/4
B) 1/4
C) 1/3
D) 2/3
E) None of these

Answer: A
Solution:

Sample space = [TT, TH, HT, HH]
Total number of ways = 2 × 2 = 4.

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Favourite Cases = 3
P (A) = 3/4

3: What is the probability of getting a numbered card when drawn from the pack of 52 cards?

A) 1/13
B) 1/9
C) 9/13
D) 11/13
E) None of these

Answer: C
Solution:

Total Cards = 52.
*Numbered Cards = **9** (2, 3, 4, 5, 6, 7, 8, 9, 10) in each suit*
Numbered cards in four suit = 4 × 9 = 36
P (E) = 36/52 = 9/13

4: There are 7 purple clips and 5 brown clips. Two clips are selected one by one without replacement. Find the probability that the first is brown and the second is purple.

A) 1/35
B) 35/132
C) 1/132
D) 35/144
E) None of these

Answer: B
Solution:

P (B) × P (P) = (5/12) x (7/11) = 35/132

5: Find the probability of getting a sum of 8 when two dice are thrown.

A) 1/8
B) 1/5
C) 1/4
D) 5/36
E) 1/3

Answer: D

Solution:

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Total number of ways = 6 × 6 = 36 ways.
Favorable cases = (2, 6) (6, 2) (3, 5) (5, 3) (4, 4) — 5 ways.
P (A) = 5/36 = 5/36

6: Find the probability of an honor card when a card is drawn at random from the pack of 52 cards.

A) 4/13
B) 1/3
C) 5/12
D) 7/52
E) None of these

Answer: A
Solution:

Honor cards = 4 (A, J, Q, K) in each suit
Honor cards in 4 suit = 4 × 4 = 16
P (honor card) = 16/52 = 4/13

7: What is the probability of a face card when a card is drawn at random from the pack of 52 cards?

A) 1/13
B) 2/13
C) 3/13
D) 4/13
E) 5/13

Answer: C
Solution:

Face cards = 3 (J, Q, K) in each suit
Face cards in 4 suits = 3 × 4 = 12 Cards.
P (face Card) = 12/52 = 3/13

8: If two dice are rolled together then find the probability of getting at least one '3'.

A) 11/36
B) 1/12
C) 1/36
D) 13/25
E) 13/36

Answer: **A**
Solution:

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Total number of ways = 6 × 6 = 36.
Probability of getting number '3' at least one time
= 1 – (Probability of getting no number 4)
= 1 – (5/6) × (5/6)
= 1 – 25/36
= 11/36

9: If a single six-sided die is rolled then find the probability of getting either 3 or 4.

A) 1/2
B) 1/3
C) 1/4
D) 2/3
E) 1/6

Answer: B
Solution:

Total outcomes = 6
The probability of getting a single number when rolled a die = 1/6
So, P(3) = 1/6 and P(4) = 1/6
Thus, the probability of getting either 3 or 4
= P(3) + P(4)
= 1/6 + 1/6
= 1/3

10: A container contains 1 red, 3 black, 2 pink, and 4 violet gems. If a single gem is chosen at random from the container, then find the probability that it is violet or black.

A) 1/10
B) 3/10
C) 7/10
D) 9/10
E) None of these

Answer: C
Solution:

Total gems =(1 + 3 + 2 + 4) = 10
probability of getting a violet gem = 4/10
The probability of getting a black gem = 3/10
Now, P (Violet or Black) = P(violet) + P(Black)
= 4/10 + 3/10
= 7/10

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11: A jar contains 63 balls (1, 2, 3,……., 63). Two balls are picked at random from the jar one after one and without any replacement. What is the probability that the sum of both balls drawn is even?

A) 5/21
B) 3/23
C) 5/63
D) 19/63
E) None of these

Answer: E
Solution:

The sum of numbers can be even if we add either two even numbers or two odd numbers.

Number of even numbers from 1 to 63 = 31
Number of odd numbers from 1 to 63 = 32

*Probability of getting **two even** numbers = (32/63) * (31/62) = **16/63***
*Probability of getting **two odd** numbers = (31/63) * (30/62) = **5/21***

*P(two even numbers **OR** two odd numbers) = 16/63 + 5/21 = **31/63***

12: There are 30 students in a class, 15 are boys and 15 are girls. In the final exam, 5 boys and 4 girls made an A grade. If a student is chosen at random from the class, what is the probability of choosing a girl or an 'A-grade student?

A) 1/4
B) 3/10
C) 1/3
D) 2/3
E) None of these

Answer: D
Solution:

Here, the total number of boys = 15 and the total number of girls = 15

Also, girls getting A grade = 4 and boys getting an A grade = 5
Probability of choosing a girl = 15/30

Probability of choosing A grade student= 9/30

Now, an A-grade student chosen can be a girl.
So the probability of choosing it = 4/30

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Required probability of choosing a girl or an A-grade student
= 15/30 + 9/30 – 4/30
= 1/2 + 3/10 – 2/15
= 2/3

13: What is the probability when a card is drawn at random from a deck of 52 cards is either an ace or a club?

A) 2/13
B) 3/13
C) 4/13
D) 5/23
E) None of these

Answer: C
Solution:

There are 4 aces in a pack, 13 club cards, and 1 ace of a club card.

Now, the probability of getting an ace = 4/52

The probability of getting a club = 13/52
The probability of getting an ace of the club = 1/52

Required probability of getting an ace or a club
= 4/52 + 13/52 – 1/52
= 16/52
= 4/13

14: One card is drawn from a deck of 52 cards well shuffling. Calculate the probability that the card will not be a king.

A) 12/13
B) 3/13
C) 7/13
D) 5/23
E) None of these

Answer: A
Solution:

Well-shuffling ensures equally likely outcomes.
Total king of a deck = 4

The number of favourable outcomes F= 52 – 4 = 48
The number of possible outcomes = 52

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Therefore, the required probability
= 48/52 = 12/13

15: If P(A) = 7/13, P(B) = 9/13 and P(A∩B) = 4/13, find the value of P(A|B).

A) 1/9
B) 2/9
C) 3/9
D) 4/9
E) None of these

Answer: D
Solution:

P(A|B) = P(A∩B)/P(B) = (4/13)/(9/13) = 4/9.

16: A one-rupee coin and a two-rupee coin are tossed once, and then calculate a sample space.

A) [HH, HT, TH, TT]
B) [HH, TT]
C) [TH, HT]
D) [HH, TH, TT]
E) None of these

Answer: A
Solution:

The outcomes are either Head (H) or tail(T).
Now,heads on both coins = (H, H) = HH
Tails on both coins = (T, T) = TT

Probability of head on one rupee coin and Tail on the two rupee
coins = (H, T) = HT
And Tail on one rupee coin and Head on the two rupee coin = (T, H)
= TH

Thus, the sample space,S = [HH, HT, TH, TT]

17: There are 20 tickets numbered 1 to 20. These tickets are mixed up and then a ticket is drawn at random. Find the probability that the ticket drawn has a number that is a multiple of 4 or 5.

A) 1/4
B) 2/13
C) 8/15

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D) 9/20
E) None of these

Answer: E
Solution:

Here, S = {1, 2, 3, 4, ..., 19, 20} = 20

Multiples of 4: *4, 8, 12, 16, 20 (5 tickets)*
Multiples of 5: *5, 10, 15, 20 (4 tickets)*

Notice that ticket number 20 is a multiple of both 4 and 5, so we have counted it twice. Therefore, we need to subtract one from the total count.

Total number of tickets with numbers that are multiples of 4 or 5: 5 + 4 – 1 = 8
The total number of tickets is 20, so the probability of drawing a ticket with a number that is a multiple of 4 or 5 is:

P = 8/20 = 2/5 = 0.4

Therefore, the probability that the ticket drawn has a number that is a multiple of 4 or 5 is 0.4 or 40%.

Direction (18 – 20):
In a school the total number of students is 300, 95 students like chicken only, 120 students like fish only, 80 students like mutton only and 5 students do not like anything above. If randomly one student is chosen, find the probability that**.**

18) The student likes mutton.
19) He likes either chicken or mutton
20) He likes neither fish nor mutton.

Solution(18 – 20):

The total number of favorable outcomes = 300 (Since there are 300 students altogether).

The number of times a chicken liker is chosen = 95 (Since 95 students like chicken).
The number of times a fish liker is chosen = 120.
The number of times a mutton liker is chosen = 80.
The number of times a student is chosen who likes none of these = 5.

18: Find the probability that the student likes mutton.

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A) 3/10
B) 4/15
C) 1/10
D) 1/15
E) None of these

Answer: B
Solution:

Therefore, the probability of getting a student who likes mutton

= 80/300
= 4/15

19: What is the probability that the student likes either chicken or mutton?

A) 7/12
B) 5/12
C) 3/4
D) 1/12
E) None of these

Answer: A
Solution:

The probability of getting a student who likes either chicken or mutton
= (95+80)/300
= 175/300
= 7/12

20: Find the probability that the student likes neither fish nor mutton.

A) 1/2
B) 1/5
C) 1/3
D) 1/4
E) 1/6

Answer: C
Solution:

The probability of getting a student who likes neither fish nor mutton
= (300–120−80)/300
= 100/300
= 1/3

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Direction (21-23):
A box contains 90 number plates numbered 1 to 90. If one number plate is drawn at random from the box then find out the probability that

21) The number is a two-digit number
22) The number is a perfect square
23) The number is a multiply of 5

21: Find the probability that the number is a two-digit number.

A) 1/9
B) 1/10
C) 9/10
D) 7/10
E) None of these

Answer: C
Solution :

Total possible outcomes = 90 (Since the number plates are numbered from 1 to 90).

*Number of favorable outcomes
= 90 – 9 = 81 (here, except 1 to 9, other numbers are two-digit number.)*

*Thus required probability
= Number of Favourable Outcomes /Total Number of Possible Outcomes
= 81/90
= 9/10.*

22: What is the probability that the number is a perfect square?

A) 1/9
B) 1/10
C) 9/10
D) 1/7
E) None of these

Answer: B
Solution:

*Total possible outcomes = 90.
Number of favorable outcomes = 9   [here 1, 4, 9, 16, 25, 36, 49, 64, and 81 are the perfect squares]*

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Thus the required probability =
9/90   =1/10

23: Find the probability that the number is a multiple of 5.

A) 1/5
B) 1/6
C) 1/10
D) 1/8
E) 9/10

Answer: A
Solution:

Total possible outcomes = 90.
Number of favourable outcomes = 18   (here, 5 × 1, 5 × 2, 5 ×
3, …., 5 × 18 are multiple of 5).
Thus, the required probability= 18/90 =1/5