

Supremum Classes



1. A bag contains 7 black and 4 white balls two balls are drawn at a time from the bag. The probability at least one white ball is selected:



C. $\frac{28}{55}$



2. A coin is tossed 7 times. Then the probability that at least 4 consecutive heads appear is:

A. 3/16

B. 5/32

C. 5/16

D. 1/8

3. A man throws a die until he gets a number bigger than 3. The probability that he gets 5 in the last throw

D. $\frac{1}{36}$

4. A natural numbers 'x' is chosen at random form the first 1000 natural numbers. If [.] denotes the greatest integer function and the probability that

$$\left[\frac{x}{2}\right] + \left[\frac{x}{3}\right] + \left[\frac{x}{5}\right] = \frac{31x}{30}$$

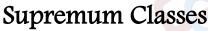
A. $\frac{31}{1000}$

C. $\frac{33}{1000}$

5. There are 10 tickets numbers 0,1,2,3,, 9 Two tickets are drawn. If the numbers obtained by writing the digits together is a perfect square, then the probability that sum of digits is 9 is

B. $\frac{5}{7}$

D. None of these







6.If p and q are chosen randomly from the set $\{1,2,3,4,5,6,7,8,9,10\}$ with replacement, Then the probability that the roots at the equations $x^2 + px + q = 0$.

A. are real is
$$\frac{33}{50}$$

B. are imaginary is
$$\frac{19}{50}$$

C. are real and equal is
$$\frac{3}{100}$$

D. are real and distinct is
$$\frac{59}{100}$$

7. Two distinct number a and b are chosen randomly form the set $\{2,2^2,2^3,....2^{25}\}$. Then the probability that $\log_a b$ is an integer is

A.
$$\frac{131}{300}$$

B.
$$\frac{31}{300}$$

C.
$$\frac{21}{300}$$

D.
$$\frac{62}{300}$$

8. A and B two alliteratively with a pair of dice. A wins if he throws a sum 6 before B throws 7 and B wins if he throws a 7 before A throws sum
6. If A starts the game his chance of winnings is

A.
$$\frac{30}{61}$$

B.
$$\frac{31}{61}$$

C.
$$\frac{15}{61}$$

D.
$$\frac{60}{61}$$

9. If two events A and B such that $P(A^c) = 0.3$, $P(B) = 0.5 \& P(A \cap B) = 0.3$, then $P(B \mid A \cup B^c)$ is





10. A and B are event of an experiment such that 0 < P(A), P(B) < 1. If $P(B^c) > P(A^c)$, Then

A.
$$P(A \cap B^c) < P(A^c \cap B)$$

B.
$$P(A \cap B^c) = P(A^c \cap B)$$

C.
$$P(B|A) < P(A|B)$$

D.
$$P(B|A) > P(A|B)$$

11. A natural number x is chosen from the first 100 natural numbers. The probability that

A.
$$\frac{3}{25}$$

B.
$$\frac{1}{50}$$

C.
$$\frac{7}{25}$$

D. none of these

12. Two person each make a single throw with a pair of dice. The probability that their throws are unequal is:

A.
$$\frac{1}{6^3}$$

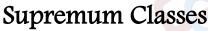
B.
$$\frac{70}{6^3}$$

C.
$$\frac{115}{216}$$

B.
$$\frac{70}{6^3}$$
D. $\frac{575}{648}$

13. Consider the system of equations ax + by = 0 and cx + dy = 0 where $a, b, c, d \in \{1, 2\}$. The probability that the system of equations has a unique solution is:

14. Box I contains 3 white, I blacks, Box II contains 2 white. 2 black and Box III contains I white, 3 black balls. If from each of these boxes one ball is drawn at random, find the probability that 2 white and 1 black ball will be drawn









15. Assume that birth of a boy or girl to a couple to be equally likely, mutually exclusive and independent of the other children in the family for a couple having 6 children the probability that their "three oldest are boys" is:

A.
$$\frac{20}{64}$$

B.
$$\frac{1}{64}$$

C.
$$\frac{8}{64}$$

D. none

16. If E_1, E_2 are two events such that $P(E_1) = \frac{3}{10}, P(E_2) = \frac{1}{4} \& P(E_1 \cap E_2) = \frac{1}{5}$, then

$$P((E_1^C/E_2^C)^C) =$$

A.
$$\frac{2}{15}$$

B.
$$\frac{11}{15}$$

C.
$$\frac{13}{15}$$

$$\frac{14}{15}$$

17. In a 3×3 matrix the entries a_{ij} are randomly selected from the digits $\{0,1,2,...,9\}$ with replacements.

The probability that the 3-digits number in each row will be divisible by 11 is

A.
$$\frac{7^3}{10^6}$$

B.
$$\frac{13^3}{10^6}$$

C.
$$\frac{78^3}{10^9}$$

D.
$$\frac{91^3}{10^9}$$

18. For independent events $A_1, ..., A_n$ $P(A_i) = \frac{1}{i+1}, i = 1, 2, ..., n$. Then the probability

that none of the events will occur is:

A.
$$n/(n+1)$$

B.
$$n-1(n+1)$$

C.
$$1/(n+1)$$

D.
$$n+1(n+2)$$



19. For two events A and B let P(A) = 3/5, P(B) = 2/3, then which of the following statements is correct?

A.
$$P(A \cap \overline{B}) \leq \frac{1}{3}$$

B.
$$P(A \cup B) \ge \frac{2}{3}$$

C.
$$\frac{4}{15} \le P(A \cap B) \le \frac{3}{5}$$

D.
$$\frac{2}{5} \le P(A | B) \le \frac{9}{10}$$

20. A number x is chosen at random form the first 100 natural. The probability that it satisfies

A.
$$x^2 - 25x \le 150$$
 is 0.3

B.
$$x^2 - 17x + 30 \ge 0$$
 is 0.88

C. $30x-x^2$ is a perfect square of a natural numbers is 0.07

D.
$$30x - x^2 < 0$$
 is 0.7

21. When a fair die is thrown twice let (a, b) denote the outcome in which the first throw shows a and the second shows b. Further, let A, B and C be the following events:

$$A = \{(a,b) \mid a \text{ is odd}\}$$

$$B = \{(a,b) | b \text{ is odd}\} \& C = \{(a,b) | a+b \text{ is odd}\}$$

Then-

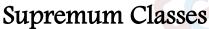
A.
$$P(A \cap B) = 1/4$$

B.
$$P(B \cap C) = 1/4$$

C.
$$P(A \cap C) = 1/4$$

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

22. Let E, F and G be any three events with P(E) = 0.3, P(F | E) = 0.2, P(G | E) = 0.1 and $P(F \cap G | E) = 0.05$. Then $P(E - (F \cup G))$ equals







23. Let E and F be two events with 0 < P(E) < 1, $0 < P(F) < 1 & P(E) + P(F) \ge 1$. which of the following statements is are TREU?

A.
$$P(E^c) \leq P(F)$$

B.
$$P(E \cup F) < P(E^c \cup F^c)$$

C.
$$P(E|F^c) \ge P(F^c|E)$$

D.
$$P(E^c | F) \leq P(F | E^c)$$

24. Let E and F be two independent events with

$$P(E|F)+P(F|E)=1, P(E\cap F)=\frac{2}{9} \& P(F) < P(E).$$

Then P(E) equals

A.
$$\frac{1}{3}$$

B.
$$\frac{1}{2}$$

C.
$$\frac{2}{3}$$

D.
$$\frac{3}{4}$$

25. A fair die is rolled 3 times. The conditional probability of 6 appearing exactly once given that it appeared at least once equals

A.
$$\frac{3\left(\frac{1}{6}\right)^2\left(\frac{5}{6}\right)}{1-\left(\frac{5}{6}\right)^3}$$

B.
$$\frac{\left(\frac{1}{6}\right)\left(\frac{5}{6}\right)^2}{1-\left(\frac{5}{6}\right)^3}$$

C.
$$\frac{3\left(\frac{1}{6}\right)\left(\frac{5}{6}\right)^2}{1-\left(\frac{5}{6}\right)^3}$$

D.
$$\frac{\left(\frac{1}{6}\right)^2 \left(\frac{5}{6}\right)}{1 - \left(\frac{5}{6}\right)^3}$$

26. Let E, F and G be three events such that the events E and F are mutually exclusive,

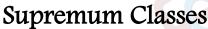
 $P(E \cup F) = 1$, $P(E \cap G) = \frac{1}{4} & P(G) = \frac{7}{12}$. Then $P(F \cap G)$ equals

A.
$$\frac{1}{12}$$

B.
$$\frac{1}{4}$$

C.
$$\frac{5}{12}$$

D.
$$\frac{1}{3}$$







- 27. A fair die is rolled times independently. Given that 6 appeared at least once, the conditional probability that 6 appeared exactly twice equals _____
- 28. Let E, F and G b three events such that

$$P(E \cap F \cap G) = 0.1, P(G|F) = 0.3$$
 and $P(E|F \cap G) = P(E|F)$.

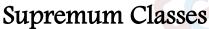
Then $P(G|E \cap F)$ equals

- 29. For three events A, B and C, P (Exactly one of A or B occurs) =P (Exactly one of B or C occurs) =P(Exactly one of C or A occurs) =41 and P (All the three events occur simultaneously)=161. Then the probability that at least one of the events occurs, is.
- 30. Consider four coins labelled as 1,2,3 and 4. Suppose that the probability of obtaining a 'head' in a single toss of the i^{th} coins is $\frac{i}{4}$, i = 1,2,3,4. A coin is chosen uniformly at random and flipped. The Probability that the flip resulted in a 'head' is ______
- 31. Let $A_1, A_2 & A_3$ be three events such that

$$P(A_i) = \frac{1}{3}, i = 1, 2, 3; P(A_i \cap A_j) = \frac{1}{6}, 1 \le i \ne j \le 3 \text{ and } P(A_1 \cap A_2 \cap A_3) = \frac{1}{6}.$$

Then the probability that none of the events A_1, A_2, A_3 occurs equals

32. There are four uruses labeled $U_1, U_2, U_3 \& U_4$ each containing 3 blue and 5 real balls. The fifth urn, labelled U_5 , contains 4 and 4 red balls. An is selected at random from these five urns a ball is drawn at random at from it. The Probability that selected ball is red is -







- 33. A and B are two weak students is Mathematics and their chances of solving a problem correctly are $\frac{1}{8}$ and $\frac{1}{12}$ respectively. They are given a problem and they obtain the same answer. If the probability of a common mistake is $\frac{1}{1001}$, then
- a. the probability Both obtaining answer are same that the answer was correct is _____
- b. the probability that the answer was correct is_____