



MATHS

BOOKS - CENGAGE MATHS (HINGLISH)

PROBABILITY AND STATISTICS

Question Bank

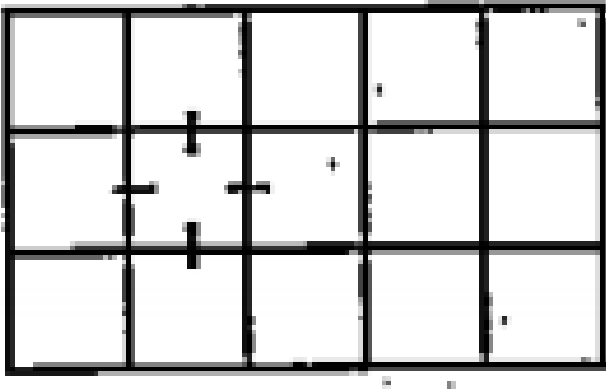
1. If two events A and B are such that $P(A^c) = 0.3$, $P(B) = 0.4$ and $P(A \cap B^c) = 0.5$, then $P\left(\frac{B}{A \cup B^c}\right)$ equals

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2. Mr. A has six children and atleast one child is a girl, then probability that Mr, A has 3 boys and 3 girls, is

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3. There are 4 horizontal and 6 vertical equispaced lines as shown. If a rectangle is randomly selected then probability that is a square is



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4. A bag contains $(2n + 1)$ coins. It is known that n of these coins have a head on both sides, whereas the remaining $(n + 1)$ coins are fair. A coin is selected at random from the bag and tossed. If the probability of getting a head is $\frac{31}{42}$, then n is equal to

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5. Three distinct integers are randomly selected from the set of integers from 16 to 30 (inclusive). Probability that their sum is even, is

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6. A number x is chosen at random from the set $(1, 2, 3, 4, \dots, 100)$. Define the event A - the chosen number x satisfies, $\frac{(x - 10)(x - 50)}{x - 30} \geq 0$. Then $P(A)$ is equal to

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7. A and B stand in a ring along with 10 other persons. If the arrangement is at random, the probability that there are exactly 3 persons between A and B , is

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8. A 2×2 matrix is formed with entries from the set $\{0, 1\}$. The probability that it is singular, is



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9. Two boys A and B find the jumble of n ropes lying on the floor. Each takes hold of one loose end randomly. If the probability that they are both holding the same rope is $\frac{1}{101}$ then the number of ropes is equal to



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10. On a normal standard die one of the 21 dots from any one of the six faces is removed at random with each dot equally likely to be chosen. The die is then rolled. The probability that the top face has an odd number of dots is



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11. Miss C has either Tea or Coffee at morning break. If she has tea one morning, the probability she has tea the next morning is 0.4. If she has coffee one morning, the probability she has coffee next morning is 0.3. Suppose she has coffee on a Monday morning. The probability that she has tea on the following Wednesday morning is

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12. A bowl has 6 red marbles and 3 green marbles. The probability that a blind folded person will draw a red marble on the second draw from the bowl without replacing the marble from the first draw, is

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13. Lot A consists of $3G$ and $2D$ articles. Lot B consists of $4G$ and $1D$ article. A new lot C is formed by taking 3 articles from A and 2 from B . The probability that an article chosen at random from C is defective, is

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14. A person throws four dice simultaneously. The probability of getting different numbers on all four dice, is

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15. Let A and B are events of an experiment of $P(A) = \frac{1}{4}$, $P(A \cup B) = \frac{1}{2}$ then value of $P(B|A^C)$ is $\frac{1}{k}$ then value of k is

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16. Let $S = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10$. Two subsets A and B of S are chosen randomly with replacement with B chosen after A . The probability that A is a subset of B can be expressed as $\frac{p^a}{q^8}$ for some s, p and q . Find the value of $\left(\frac{b}{a} + p + q\right)$.

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17. The probability that a positive two digit number selected at random has its tens digit at least three more than its unit digit is

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18. Of all the system of equations in x, y and z

$$ax + by + cz = d$$

$$x + y = d$$

$$y + ez = 1$$

formed by choosing a, b, c, d, e from the set $0, 1, 2, 3, 4, 5, 6, 7, 8$ with replacement, the probability it does not possess a unique solution is $\frac{2^m}{3^n}$

(in lowest terms), $m, n \in \mathbb{N}$. The value of $(n - m)$ is

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19. If the papers of 4 students randomly distributed for checking among 7 teachers, then the probability that all the 4 papers are checked by exactly

2 teachers is $n \cdot m$ where n, m are 'natural numbers and $HCF(n, m) = 1$

. Then number of positive divisors of $(n + m)$ is

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20. A six faced fair dice is thrown until 2 comes, then the probability that 2 comes in even number of trials is (dice having six faces numbered 1, 2, 3, 4, 5 and 6)

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21. If a variable takes the discrete values $p + 4, p - \frac{7}{2}, p - \frac{5}{2}, p - 3, p - 2, p + \frac{1}{2}, p - \frac{1}{2}, p + 5 (p > 0)$, and the median $p - K$ then find k

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22. The variance of 20 observations is 5 . If each observation is multiplied by 2 then the new variance of the resulting observations, is:

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23. The mean weight of 9 items is 15 . If one more item is added to the series, the mean becomes 16 . The value of 10th item is

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24. Consider the frequency distribution of the given pumber If mean of the distribution is equal to 3 , then the value of f is

Value	1	2	3	4
Frequency	5	4	0	f

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25. If m and σ^2 are the mean and variance of random variable x , whose distribution is given by then sum of m and σ^2 is

$X = x$	0	1	2	3	4
$P(X = x)$	$\frac{1}{3}$	$\frac{1}{2}$	0	$\frac{1}{6}$	0

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26. x_1, x_2, \dots, x_{34} are numbers such that $x_i = x_{i+1} - 150 \forall i \in 1, 2, 3, \dots, 9$ and $x_{i+1} - x_{i+2} = 0$ $\forall i \in 10, 11, 12, \dots, 33$, then median of x_1, x_2, \dots, x_{34} is

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27. The mean of 5 observations is 4 and their variance is 52. If three of them are 1, 2, 6 then the sum of other two

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28. If x_1, x_2, \dots, x_{18} are observations such that $\sum_{j=1}^{18} (x_j - 8) = 9$ and $\sum_{j=1}^{18} (x_j - 8)^2 = 45$, then the standard deviation of these observations

is:

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29. Two cards are drawn without replacement from a wellshuffled deck of 52 cards. Let X be the number of face cards drawn, then the sum of mean and variance of X will be.

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30. Let x_1, x_2, \dots, x_n be n observations such that $\sum x_i^2 = 200$ and $\sum x_i = 40$ then least integral value of n

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31. If in a frequency distribution, the mean and median are 25 and 26 , then its mode is approximately.

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32. The mean of two samples of sizes 200 and 300 were found to be 25,10 respectively. Their standard deviation were 3 and 4 respectively. The variance of combined sample of size 500 is

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33. The variance of first 20-natural numbers is

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34. If the coefficient of skewness of distribution is 0.32. If its standard deviation is 6.5 and mean is 29.6, then the mode of the distribution is

given by



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35. Find the mean deviation from the mean for the following data:

6, 7, 10, 12, 13, 4, 8, 20



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36. For the following observations of marks of 5 students of a tutorial group:

Marks out of 25: 8, 12, 13, 15, 22

Then the standard deviation of the above observation is



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37. Calculate the mean deviation from the median of the following data:

Wages per week (in Rs.)	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of workers	4	6	10	20	10	6	4



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