

Question Bank

Mathematics ,class -XI

CH-1 SETS

Q1. Two finite set have m and n elements. The number of subset of first set is 112 more than that of second set . Find the value of m and n.

Q2. Suppose that $A_1, A_2, A_3, A_4, \dots, A_{30}$ are 30 sets each having 5 elements and $B_1, B_2, B_3, \dots, B_n$ are n sets each with 3 elements , let $\bigcup_{i=1}^{30} A_i = \bigcup_{j=1}^n B_j = S$ and each element of S belongs to exactly 10 of the A_i and exactly 9 of the B_i , then find n-

Q3. Let $P = \{\theta: \sin\theta - \cos\theta = \sqrt{2} \cos\theta\}$ and $Q = \{\theta: \sin\theta + \cos\theta = \sqrt{2} \sin\theta\}$ be two sets prove that $P = Q$

Q4. $A_1, A_2, A_3, A_4, \dots, A_{99}$ be sets such that $n(A_i) = i + 1, i = 1, 2, 3, \dots, 99$ and $A_1 \subset A_2 \subset \dots \subset A_{99}$ then show that a) $n(\bigcup_{i=1}^{99} A_i) = 100$ b) $n(\bigcap_{i=1}^{99} A_i) = 2$

Q5. Let A and B are two sets containing 3 and 6 elements respectively . Find the maximum and minimum number of elements in $A \cup B$

Q6. $U = \{1, 2, 3, 4, 5, 6, 8\}$ $A = \{2, 3, 4\}$, $B = \{3, 4, 5\}$ Verify both demorgan's law

Q7. If $A = \{x; x = 2n, n \in \mathbb{N}\}$, $B = \{X; X = 2n-1, n \in \mathbb{N}\}$ Find $A \cap B$

Q8. Let $T = \{x / \frac{x+5}{x-7} - 5 = \frac{4x-40}{13-x}\}$. is T is a non empty set justify.

Q9. Prove that $A - (A \cap B) = A - B$

Q10. Given that $N = \{1, 2, 3, \dots, 100\}$ then write the subset B of N whose elements are represented by $x+2$

Q11. Two finite sets A and B have m and k elements respectively. If the ratio of cardinal number of power sets of A to the cardinal number of power set of B is $64:1$ and $n(A) + n(B) = 12$, then find the value of m and k .

CH --2 Relation and Functions

Q1. Find the Range of the function $f(x) = \frac{1}{1-2 \cos X}$

Q2. Find the Domain and Range of the Function $f(x) = \frac{4-x}{x-4}$

Q3. If $F(x)$ is odd function $g(x)$ is even function then What type of function $fx) + g(x)$?

Q4. Draw the graph of Followind functions and Write its Domain and Range.

a) Modulus Function

b) Greatest Integer Function

Q5. If $F(x) = \frac{a^x}{a^x + \sqrt{a}}$ then find $f(x) + f(1-x)$

Q6. If F be the exponential function and g be the logarithmic function , then find $fg(1)$.

Q7. Find the Domain of the function $\frac{1}{\sqrt{[x]^2 - [x] - 6}}$

Q8. If $A = \{2, 4, 6, 9\}$, $B = \{, 4, 6, 18, 27, 54\}$ and a relation R from A to B is define by

$R = \{(ab) ; a \in A, b \in B, a \text{ is the factor of } b \text{ and } a < b\}$ then Write R in the roster form.

Q9. Let $n(A) = m$, $n(B) = n$ then find

- a) the total number of non empty relations b) total number of functions

Q10. Let $A = \{-1, 2, 3\}$ $B = \{1, 3\}$ Determine

- a) $A \times B$ b) $A \times A$ c) $B \times A$ d) $B \times B$

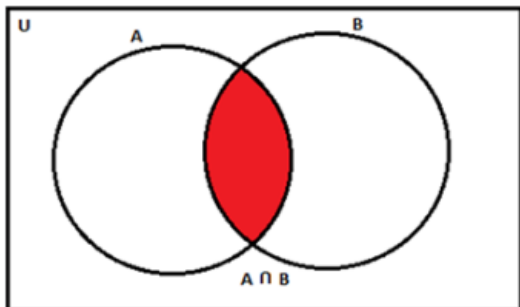
Q11. The relation f and g are defined by:

$$f(x) = \begin{cases} x^2 & 0 \leq x \leq 3 \\ 3x & 3 \leq x \leq 10 \end{cases} \quad x \in \mathbb{Z}$$

$$g(x) = \begin{cases} x^2 & 0 \leq x \leq 2 \\ 3x & 2 \leq x \leq 10 \end{cases} \quad x \in \mathbb{Z}$$

Show that f is a function and g is not a function.

Q12. 5 students Arpit, Akshay, David, Aditya and Raghav, each of age 16 years are selected from Class 11 for the school football team. Their heights in centimetres are 182, 181, 180.5, 180 and 179.5 respectively. Answer the following questions by taking A as the set of ages of students and B as set of height of students.



- a) Write sets A and B in roster form.
- b) Find the Cartesian product of two sets A and B .
- c) Find the total number of relations from A to B .
- d) Check whether AB and BA are functions or not.
- e) Is $x^2 + y^2 = 9$ is a function?

CH-3 -TRIGONOMETRIC FUNCTIONS

Q1.If the value of $\cos 36^\circ = \frac{\sqrt{5}+1}{4}$ then find the value of $\cos^2 48^\circ - \sin^2 12^\circ$

Q2.Find the value of $\cot 5^\circ \cot 10^\circ \cot 15^\circ \dots \cot 85^\circ$

Q3.Prove that $\tan 9A - \tan 6A - \tan 3A = \tan 9A \tan 6A \tan 3A$

Q4. If $\tan A = \frac{m}{m-1}$ and $\tan B = \frac{1}{2m-1}$ then prove that $A - B = \pi / 4$

Q5. If $\tan X = \frac{1}{7}$ and $\tan Y = \frac{1}{3}$ show that $\cos 2x = \sin 4y$

Q6.Find the value of $\cos 12^\circ + \cos 84^\circ + \cos 156^\circ + \cos 132^\circ$

Q7.If $\sin(y+z-x)$, $\sin(z+x-y)$, $\sin(x+y-z)$ are in AP Prove that $\tan x, \tan y$, $\tan z$ are also in A.P

Q8.Prove that $\sin 10^\circ \sin 30^\circ \sin 50^\circ \sin 70^\circ = \frac{1}{16}$

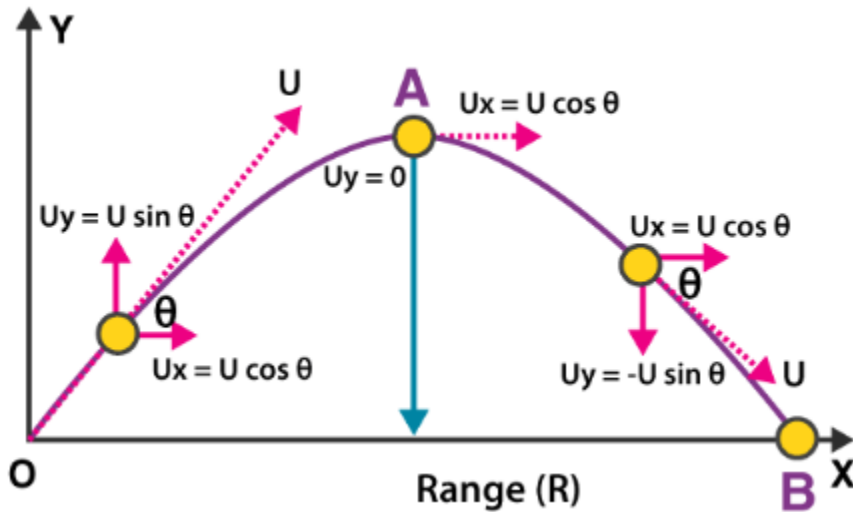
Q9.If $\tan x = \frac{b}{a}$ then value of $\sqrt{\frac{a+b}{a-b}} + \sqrt{\frac{a-b}{a+b}}$

Q10.If $\sin X = \frac{3}{5}$, $\cos y = \frac{-12}{13}$ where x and y both lies in second quadr $\sqrt{}$ ant find the value of $\sin(x+y)$

Q11.If $a = \cos y + i \sin y$, then prove the value of $\frac{1+a}{1-a} = i \cot \frac{y}{2}$

Q12 $\cos(n+2)x \cos(n+4)x + \sin(n+2)x \sin(n+4)x$ is equal to---

Q13. A javelin thrower is given a challenge to throw the javelin for a given range.



The theoretical minimum velocity that is required for the javelin is modeled by the trigonometric function $v = \frac{2 \cos 2\theta}{1 + \cos \theta}$, where θ is the angle that produces the required range at initial velocity. Here, air resistance, height of the thrower, unit and other factors are ignored

- i) Prove that $V = 2 - \sec^2 \theta$
- ii) Express V in terms of $\tan \theta$
- iii) Find V for $\theta = \frac{\pi}{6}$

OR

For what numeric value of V , the throw is parallel to the ground?

CH-4 COMPLEX NUMBER

Q1. Find the value of $i + i^{10} + i^{20} + i^{30}$

Q2. What is the value of $\frac{i^{4n+1} - i^{4n-1}}{2}$

Q3. If complex number $Z = 2 + i$, find the value of $Z^3 + 3Z^2 - 9Z + 8$

Q4. If $|Z_1| = |Z_2| = |Z_3| = \dots = |Z_n| = 1$ then show that

$$|Z_1 + Z_2 + Z_3 + \dots + Z_n| = \left| \frac{1}{Z_1} + \frac{1}{Z_2} + \frac{1}{Z_3} + \dots + \frac{1}{Z_n} \right|$$

Q5. If $\frac{3+2i\sin\theta}{1-2i\sin\theta}$ is a real number and $0 < \theta < 2\pi$ then find the range of θ

Q6. What is the conjugate of $\frac{\sqrt{5+12i} + \sqrt{5-12i}}{\sqrt{5+12i} - \sqrt{5-12i}}$

Q7. If $a = \cos\theta + i\sin\theta$ find the value of $\frac{1+a}{1-a}$

Q8. Evaluate $\sum_{n=1}^{13} (i^n + i^{n+1})$ where $n \in \mathbb{N}$

Q9. What is the reciprocal of $3 + \sqrt{7}i$

Q10. If $(1+i)z = (1-i)\bar{z}$ then prove that $z = -i\bar{z}$

CH-5 LINEAR INEQUALITY

Q1. In the first four papers each of 100 marks, Rishi got 95, 72, 73, 83 marks. If he wants an average of greater than or equal to 75 marks he should score in fifth paper.

Q2. A milkman has 80% milk in this stock of 800 litres of adulterated milk. How much 100% pure milk is to be added to it so that purity is between 90% and 95%?

Q3. $\frac{5X}{4} + \frac{3X}{8} > \frac{39}{8}$, $\frac{2x-1}{12} - \frac{x-1}{3} < \frac{3x+1}{4}$

Q4. A company produced cassettes, one cassette Cost Company Rs. 30 and also an additional fixed cost 26000 per week. The company sold each Cassette at Rs. 43. If x is number of cassettes produced and sold by the company in a week. From the following information find cost function

Q5. Find the pair of consecutive even positive, integers which are greater than 5 and are such that their sum is less than 20.

Q6. Given that x, y and b are real numbers and $x < y$, $b < 0$, then check the inequality true or not $\frac{x}{b} > \frac{y}{b}$

Q7. Solve the inequality $\frac{1}{x-2} < 0$

Q9. Solve the system of inequalities $:(x+5)-7(x-2) \geq 4x+9$, $2(x-3) -7(x+5) \leq 3x-9$

Q10. While drilling a hole in the earth, it was found that the temperature ($T^{\circ}\text{C}$) at x km below the surface of the earth was given by $T = 30 + 25(x - 3)$ when $3 \leq x \leq 15$. Between which depths will the temperature be between 200°C and 300°C ?

Q11.. The water acidity in a pool is considered normal when the average PH reading of their daily measurements is between 7.2 and 7.8. If the first two PH reading are 7.48 and 7.85. Find the range of PH value for the 3rd reading that will result in acidity level being normal.

Q12. A company manufactures cassettes and its cost and revenue functions are $C(x) = 26000 + 30x$ and $R(x) = 43x$ respectively, where x is number of cassettes produced and sold in a week.



- a) How many cassettes must be sold per week to realise some profit. [Profit = $R(x) - C(x)$]
- b) Find cost function
- c) Find Revenue function

CH-6 PERMUTATION AND COMBINATION

- Q1. Using the digits 0, 1, 2, 3, 4, 5, 6 how many 4 digit even numbers can be made, no digit being repeated?
- Q2. There are 15 points in a plane out of which only 6 are in a straight line, then
- (i) How many different straight lines can be made?
- (ii) How many triangles can be made?
- Q3. If there are 7 boys and 5 girls in a class, then in how many ways they can be seated in a row such that
- (i) No two girls sit together? (ii) All the girls never sit together?
- Q4. Using the letters of the word 'EDUCATION' how many words using 6 letters can be made so that every word contains atleast 4 vowels?
- Q5. What is the number of ways of choosing 4 cards from a deck of 52 cards? In how many of these,

(i) 3 are red and 1 is black.

(ii) All 4 cards are from different suits

(iii) Atleast 3 are face cards.

(iv) All 4 cards are of the same colour.

Q6. How many 3 letter words can be formed using the letters of the word INEFFECTIVE?

Q7. How many different four letter words can be formed (with or without meaning) using the letters of the word "MEDITERRANEAN" such that the first letter is E and the last letter is R.

Q8. If all letters of word 'MOTHER' are written in all possible orders and the word so formed are arranged in a dictionary order, then find the rank of word

a) MOTHER'

b) Random

c) Krishna

Q9. From 6 different novels and 3 different dictionaries, 4 novels and a dictionary is to be selected and arranged in a row on the shelf so that the dictionary is always in the middle. Then find the number of such arrangements.

Q10. If ${}^{15}C_{3r} : {}^{15}C_{r+1} = 11 : 3$, = 11: 3, find r

Q11. A person has six friends . In how many ways can he invite one or more of them to dinner?

Q12. Anita is doing an experiment in which she has to arrange the alphabets of the word "HARYANA" in all possible orders and notes the observations. Help her to find the answers of the following:-



- i. Number of words starting with A
- ii. Number of words having H at end
- iii. Number of words having Hand N together
- iv. Number of words having begin with H and end with N
- v. Number of words having vowels together

CH-7 BINOMIAL THERORM

Q1. Find the total number of terms in the expansion of

i) $(x+a)^{101}(x-a)^{101}$

ii) $(1+x)^{1001} - 1$

iii) $(x^2+a)^{500} - (x^2-a)^{500}$

iv) $(a+b+c)^n$ $n \in \mathbb{N}$

Q2. Using binomial theorem, prove that $6^n - 5n - 1$ is divisible by $25n \in \mathbb{N}$

Q3. Find the expansion of $(3x^2 - 2ax + 3a^2)^3$ Using binomial theorem

Q4. Which is larger $99^{50} + 100^{50}$ or 101^{50}

Q5..Using binomial theorem , prove that $2^{4n+4} - 15n - 16$ is divisible by $225n \in \mathbb{N}$

Q6. Expand $(\sqrt{\frac{x}{a}} - \sqrt{\frac{a}{x}})^6$ Using binomial theorem

Q7. Write number of terms in the expansion of $\{(2x+y^3)^4\}^7$

Q8. Using binomial theorem Evaluate $(10.1)^5$

Q9. Find the remainder left out when $8^{2n} - 62^{2n+1}$ is divided by 9.

Q10. Find the coefficient of x^5 in $(1+x)^{10}$

CH-8 SEQUENCE AND SERIES

Q1. Let S be the sum, P be the product and R be the sum of the reciprocals of 3 terms of a GP. Then find the value of $P^2 R^3 : S^3$

Q2. For positive real numbers, a, b and c if $a+b+c = 18$, find the maximum value of abc.

Q3. Find the value of $9^{\frac{1}{3}} 9^{\frac{1}{9}} 9^{\frac{1}{27}} \dots \infty$

Q4. If $|x| < 1$ and $y = x + x^2 + x^3 + \dots \infty$ then show that $x = \frac{y}{1+y}$

Q5. Find the sum of the series $x(x+y) + x^2(x^2+y^2) + x^3(x^3+y^3) + \dots$ n terms

Q6. Find the sum to the nth term $0.3 + 0.33 + 0.333 + \dots$

Q7. Find the minimum value of

j) $8^x + 8^{1-x}, x \in R$

ii) $\sqrt{\tan x} + \sqrt{\cot x}$

Q8.If x, y, z are distinct positive integers ,the find the value of $(x+y)(y+z)(z+x)$

Q9.The length of the three unequal edges of a rectangular solid block are in GP. The volume of the block is 216cm^3 . The total surface area is 252cm^2 . Find the length of the longest side.

Q10 CASE-STUDY BASED QUESTIONS:-

After striking a floor a certain ball rebounds $(4/5)^{\text{th}}$ of the height from it has fallen. The ball is gently dropped from a height of 100 metres.



Based on this information, answer the following questions:

- (i) Find the height to which the ball rebounds in 3rd rebound.
- (ii) Find the total distance travelled by the ball in first five rebounds.
- (iii) Find the total distance travelled by the ball before coming to rest.

CH-9 STRAIGHT LINES

Q1. Find the reflection of the point $(4,-13)$ about the line $5x+y+6=0$

Q2.Find the distance between the lines $y=mx+c_1$ and $y=mx+c_2$

Q3. Find the equation of the line joining the points (a,b) and $(a+b, a-b)$

Q4.A straight line cuts intercepts from the axes of coordinates the sum of whose reciprocals is a constant .Show that it always passes through a fixed point.

Q5.Show that the equation of the line passing through $(a \cos^3 \phi, a \sin^3 \phi)$ and perpendicular to the line $x \sec \phi + y \operatorname{cosec} \phi = a$ is $x \cos \phi - y \sin \phi = a \cos 2 \phi$

Q6. Find the acute angle between $x+y=0$ and $y=0$

Q7.If the line $3y+4x = 1$, $y= x+5$ and $5y+bx = 3$ are concurrent then find the value of b.

Q8.Find the slope of

a) x axis

b)y axis

Q9. If one diagonal of a square is along the line $8x - 15y = 0$ and one of the vertex is at $(1,2)$.then find the equation of the sides of the square passing through this vertex

Q10.Equation of a straight line path is $2x + y - 12 = 0$. A man is standing at a point $(2, 3)$. He wants to reach the straight line path in least possible time.



(i) Find the slope of the path followed by man.

(ii) Find the equation of the path followed by man.

(iii) Find the coordinates of point where path followed by man and given straight line path meet.

CH-10 CONIC SECTION

Q1.Find the centre of the circle $3x^2 + 3y^2 + 6x - 12y - 6 = 0$

Q2.Find the equation of circle whose end points of one of its diameter are $(-2, 3)$ and $(0, -1)$.

Q3. If parabola $y^2 = px$ passes through point $(2, -3)$, then, find the length of latus rectum.

Q4.Find the length of the latus rectum of the ellipse $3x^2 + y^2 = 12$

Q5.Find the eccentricity of the hyperbola whose latus rectum is 8 and conjugate axis is equal to half of the distance between the foci.

Q6 If the lines $5x + 12y = 3$ and $10x + 24y - 58 = 0$ are tangents to a circle, then find the radius of the circle.

Q7. Find the equation of the ellipse in which length of minor axis is equal to distance between foci. If length of latus rectum is 10 unit and major axis is along the x axis.

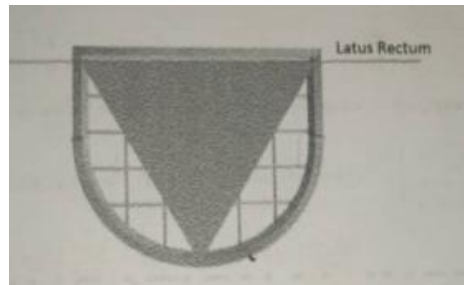
Q8. Find the equation of the hyperbolas whose axes (transverse and conjugate axis) are parallel to x axis and y axis and centre is origin such that Length of latus rectum length is 18 unit and distance between foci is 12 unit.

Q9. Prove that the line $3x + 4y + 7 = 0$ touches the circle $x^2 + y^2 - 4x - 6y - 12 = 0$ Also find the point of contact.

Q10. Find the equation of Circle in each of the following cases:

- (a) Touches both the coordinate axes in first quadrant and having radius = 1 unit
- (b) Touches both the coordinate axes in second quadrant and having radius = 2 units
- (c) Touches both the coordinate axes in third quadrant and having radius = 3 units
- (d) Touches both the coordinate axes in fourth quadrant and having radius = 4 units
- (e) Touches the x-axis at origin and having radius = 5 units
- (f) Touches the y-axis at origin and having radius = 6 units

Q11. A window is in the shape of parabola with a triangle inscribed in it. The triangle is formed in such a way that the vertices triangle coincides with vertex of parabola and end points of latus rectum. The equation of parabola is given by $x^2 = 24y$



- i. What are the vertices of triangle
- ii. Find the length of altitude of the triangle -
- iii. Find the area of the triangle?
- iv. Find the length of the longest side of the triangle?
- v. Find the length of latus rectum of the parabola?

Ch- 11 Introduction to three dimensional coordinate geometry

1. What will be the image of a) $(-1, 2, -3)$ in XZ plane b) $(-1, 2, -3)$ in YZ plane.
2. In which octant The Point P $(-5, 4, -3)$, lies?
3. If $a < 0$ $b > 0$ & $c < 0$, in which octant the Point P (a, b, c) lies.
4. Find the perpendicular distance of the point
 - a) P $(-6, 7, -8)$ from xy-plane
 - b) P $(-3, 5, -12)$ from x-axis.
 - c) P $(-3, 4, 5)$ from z-axis.
5. If the distance between the points $(a, 2, 1)$ and $(1, -1, 1)$ is 5, then find the sum of all possible value of a.
6. Find the point on y-axis which is equidistant from the point $(3, 1, 2)$ and $(5, 5, 2)$.
7. Determine the point in yz plane which is equidistant from three points A $(2, 0, 3)$, B $(0, 3, 2)$ and C $(0, 0, 1)$.
8. Find the length of the medians of the triangle with vertices A $(0, 0, 3)$, B $(0, 4, 0)$ and C $(5, 0, 0)$.
9. If the extremities (end points) of a diagonal of a square are $(1, -2, 3)$ and $(2, -3, 5)$ then find the length of the side of square.
10. Three consecutive vertices of a parallelogram ABCD are A $(6, -2, 4)$ B $(2, 4, -8)$, C $(-2, 2, 4)$. Find the coordinates of the fourth vertex.
11. If the points A $(1, 0, -6)$, B $(3, p, q)$ and C $(5, 9, 6)$ are collinear, find the value of p and q.
12. Show that the point A $(1, 3, 0)$, B $(-5, 5, 2)$, C $(-9, -1, 2)$ and D $(-3, -3, 0)$ are the vertices of a parallelogram ABCD, but it is not a rectangle. (Hint: diagonals are not equal)
13. Describe the vertices and edges of the rectangular parallelepiped with one vertex $(3, 5, 6)$ placed in the first octant with one vertex at origin and edges of parallelepiped lie along x, y and z-axis.
14. Find the coordinates of the point which is equidistant from the point $(3, 2, 2)$, $(-1, 2, 2)$, $(4, 5, 6)$ and $(2, 1, 2)$.
15. Show that the points $(0, 7, 10)$, $(-1, 6, 6)$ and $(-4, 9, 6)$ form a right angled isosceles triangle.

Ch- 12 LIMITS AND DERIVATIVES

1. Evaluate $\lim_{x \rightarrow 3} \frac{x+3}{x-2}$

Q2. Differentiate the following with respect to x using First principle method.

a. $1/x$ b. $\cos(x+1)$ c. $(2x+3)/(x+1)$

Q3. If $y = \frac{x}{x+2}$ then prove that $\frac{dy}{dx} = \frac{(1-y)y}{x}$

Q4. Evaluate: $\lim_{x \rightarrow -2} \frac{x\sqrt{x}-\sqrt{8}}{x^2-16}$

Q5. Find the derivative of $\frac{\sin x + \cos x}{\sin x - \cos x}$ with respect to x.

Q6. If $y = \sin x \cdot \cos x$, then find $\frac{dy}{dx}$

Q7. If $y = \sin 2x \cdot \cos 3x$, then find $\frac{dy}{dx}$

Q8. Differentiate $\frac{\sin x}{x}$ respect to x.

Q9. Differentiate $x^3 + 3^3 + 3^x$ with respect to x.

Q10. Evaluate $\lim_{x \rightarrow 2} \frac{x^4 - 16}{x - 2}$

Q11. Evaluate $\lim_{x \rightarrow 0} \frac{\sin x}{\sqrt{1+x} - \sqrt{1-x}}$

Q12.If $y = \sqrt{x} + \frac{1}{\sqrt{x}}$, then $\frac{dy}{dx}$ at $x = 1$ is—

Q13.Mr. Pradeep has a rectangular plot, which is used for growing vegetables. Perimeter of plot is 50m. Length and width of plot are x m and y m respectively.



Based on the above information, answer the following questions:-

- i. Find relation between x and y is
- ii. Area function, $A(x) =$
- iii. Derivative of $A(x)$ w.r.t. x [$A'(x)$] =
- iv. Value of x for which $A'(x) = 0$ is
- v. Value of $A(x)$ at $x = 12.5$ is

Ch-13 STATISTICS

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Q1.The variance of 10 observations is 16 and their mean is 12. If each observation is multiplied by 4, what is the new mean

Q2.The variance of 10 observations is 16 and their mean is 12. If each observation is multiplied by 4, what is the new standard deviation -

Q3.The standard deviation of 25 observations is 4 and their mean is 25. If each observation is increased by 10, what is the new mean-

Q4. Find the Variance of the numbers 3, 7, 10, 18, 22

Q5.The mean deviation from the mean of the following data:

Class Interval	f
20 - 29	5
30 - 39	12
40 - 49	15
50 - 59	20
60 - 69	18
70 - 79	10
80 - 89	6
90 - 99	4

Q6.The mean of the numbers, a, b, 8, 5, 10 is 6 and the variance is 6.80. Then find the possible values of a and b?

Q7.Find the mean deviation about the mean for the data: 12, 3, 18, 17, 4, 9, 17, 19, 20, 15, 8, 17, 2, 3, 16, 11, 3, 1, 0, 5

Q8.Mean and standard deviation of 100 observations were found to be 40 and 10 respectively. If at the time of calculation two observations were wrongly taken as 30 and 70 in place of 3 and 27 respectively. Find correct standard deviation.

Q9. a) Find the Variance of First 10 Natural Numbers.

b) Find the Variance of First 5 Multiples of 6.

Q10. Find the Standard Deviations of First 10 Even Natural numbers.

Q11. Following data represents the salaries of 11 employees in a firm

10000, 12000, 15000, 13000, 11000, 12000, 12000, 14000, 10000, 13000, 12000.



i. Find the mean salary.

ii. What is the median salary?

iii. When arranged in ascending order, which entry gives the median salary?

iv. The mean deviation about the median salary is

v. What is the range of salaries?

CH- 14PROBABILITY

Q1. Find the probability that in a random arrangement of the letters of the word UNIVERSITY two I's come together.

Q2 An urn contains 5 blue and an unknown number x of red balls. Two balls are drawn at random. If the probability of both of them being blue is $\frac{5}{14}$ find x .

Q3.The probability that a new railway bridge will get an award for its design is 0.48, the probability that it will get an award for the efficient use of materials is 0.36, and that it will get both awards is 0.2. What is the probability, that

(i) it will get at least one of the two awards

(ii) it will get only one of the awards.

Q4.A girl calculates that the probability of her winning the first prize in a lottery is 0.02. If 6000 tickets were sold, how many tickets has she bought?

Q5.Two dice are thrown at the same time and the product of numbers appearing on them is noted. Find the probability that the product is less than 9?

Q6 All the face cards are removed from a deck of 52 playing cards. The remaining cards are well shuffled and then one card is drawn at random. Giving ace a value 1 and similar value for other cards. Find the probability of getting a card with value less than 7.

Q7.If A,B and C are three mutually exclusive and exhaustive events of an experiment such that $3P(A) = 2P(B) = P(C)$ then find the value of $P(A)$.

Q8.A young man visit a hospital for medical checkup .The probability that he has lungs problem is 0.45 , heart problem is 0.29 and either lungs or heart problem is 0.47 .What is the probability that he has both types of problem lungs as well as heart out of 1000 ?

Q9. To make a healthy routine and to do some physical exercise during lockdown a family decided to roll a dice and based on the outcomes, they will decide activities to be done.

If the outcome is 2, 4 or 6, they will do 30 minutes walk on the roof.

If it shows 1 or 3 on the dice, 15 minutes meditation to be done.

If outcome is 5, then they will toss a coin. If it shows "Head", the family will do 5 minutes of rope skipping. If there is "Tail", family will do 20 minutes of Yoga.



- i. How many elements are there in the sample space?
- ii. What is the probability of doing walking?
- iii. What is the probability of doing rope skipping?
- iv. What is the probability of doing yoga or meditation?

Q10. Four friends Dinesh, Yuvraj, Sonu, and Rajeev are playing cards. Dinesh, shuffling a cards and told to Rajeev choose any four cards



- i. What is the probability that Rajeev getting all face card.
- ii. What is the probability that Rajeev getting two red cards and two black card.
- iii. What is the probability that Rajeev getting one card from each suit.

OR

What is the probability that Rajeev getting two king and two Jack cards.

