SARASWATI BAL MANDIR, PASCHIM VIHAR

ASSIGNMENT

CLASS: Xll

SUBJECT: MATHEMATICS

1. Let R be the relation on Z×Z, that is elements of this relation are pairs of integers, such that ((a,b),(c,d))∈R If and only if a−d=c−b. Show that R is an equivalence relation.
2. If A = and hence solve the system of equations 2x+y-3z=13, 3x+2y+z=4, x+2y-z=8.
3. Find . Use this to solve the system of equations : x-y+z=4, x-2y-2z=9, 2x+y+3z=1.
4. Let A = R– {3} and B = R – {1}. Consider the function f: A →B defined by f (x) = (x- 2)/(x -3). Is f one-one and onto? Justify your answer.
5. Determine the value of ‘k’ for which the following function is continuous at x = 3.
6. If f is continuous at x = 0, then find the value of a.
7. Check the points of non- differentiability.
8. If y= (1 – x2)  – 2 = 0.
9. If x = cos t + log tan(t/2), y = sin t, then find the values of .
10. Find the intervals in which the function f(x) = is (i) strictly increasing and (ii) strictly decreasing.
11. Prove that the height of the cylinder of maximum volume that can be inscribed in a sphere of radius R is 2R/√3. Also, find the maximum volume.
12. The volume of a cube is increasing at the rate of 8 /s. How fast is the surface area increasing when the length of its edge is 12 cm?
13. Write the principal value of
14. Find the value of x – y, if 2
15. Find matrix A such that
16. Solve the following differential equation (i) .

(ii)

(iii)

1. Evaluate
2. properties of integrals for 2nd and 3rd part.
3. Find the area of the region lying above X-axis and included between the circle = 8x and inside the parabola = 4x .
4. Using integration, find the area of the region : {(x, y): 0 ≤ 2y ≤ , 0 ≤ y ≤ x, 0 ≤ x ≤ 3}.
5. If a⃗ ,b⃗ ,c⃗ are unit vectors such that a⃗ +b⃗ +c⃗ = 0, then write the value of a⃗ ⋅b⃗ +b⃗ ⋅c⃗ +c⃗ ⋅a⃗
6. The scalar product of the vector a⃗ = î + ĵ + k̂ with a unit vector along the sum of the vectors b⃗ = 2î + 4ĵ – 5k̂ and c⃗ = λî + 2ĵ + 5k̂ is equal to 1. Find the value of λ and hence find the unit vector along b⃗ + c⃗ .
7. Find the shortest distance between the lines r⃗ = (4î – ĵ) + λ(î + 2ĵ – 3k̂) and r⃗ = (î – ĵ + 2k̂) + μ(2î + 4ĵ – 5k̂).
8. Find the vector and cartesian equations of the line through the point (1, 2, – 4) and perpendicular to the two lines

r⃗ = (8î – 19ĵ + 10k̂) + λ(3î – 16ĵ + 7k̂) and

r⃗ = (15î + 29ĵ + 5k̂) + µ (3î + 8ĵ – 5k̂).

1. Solve the following LPP graphically:
Minimise Z = 5x + 10y subject to the constraints
x + 2y ≤ 120
x + y ≥ 60,
x – 2y > 0 and x, y ≥ 0
2. Assume that the chances of a patient having a heart attack is 40%. Assuming that a meditation and yoga course reduces the risk of heart attack by 30% and prescription of certain drug reduces its chance by 25%. At a time, a patient can choose anyone of the two options with equal probabilities. It is given that after going through one of the two options, the patient selected at random suffers a heart attack. Find the probability that the patient followed a course of meditation and yoga. Interpret the result and state which of the above stated methods, is more beneficial for the patient?