

Question 1. Evaluate the following integrals.

a) $\int_1^e \ln y \, dy$ b) $\int_{e^a}^{e^b} \frac{1}{x \ln x} \, dx$ c) $\int_1^e e^{\ln x^{-1}} \, dx$ d) $\int_5^5 e^5 \, dx$ e) $\int_0^1 \sqrt[3]{(2x)} \, dx$

Answer 1.

Question 2.

a) Find determinat of M by using definetion of determinant , $M = \begin{bmatrix} 1 & 0 & -2 \\ 1 & -2 & 1 \\ -1 & 1 & 0 \end{bmatrix}$.

b) Find the inverse of A , where $A = \begin{bmatrix} -2 & 1 \\ 1 & -2 \end{bmatrix}$ by using the classical adjoint of A .

Answer 2.

Question 3. Solve the following linear systems of equations using by matrix reduction method.

a)

$$\begin{aligned}2x_1 - 3x_2 &= 6 \\3x_1 + 4x_2 &= 1/2\end{aligned}$$

b)

$$\begin{aligned}2x_1 + 6x_2 &= -3 \\x_1 + 3x_2 &= 2.\end{aligned}$$

Answer 3.

Question 4. a) For $w = f(x, y, z) = x^2y + y^2z + z^2x$, find

$$\left(\frac{\partial^2 w}{\partial x^2} + \frac{\partial^2 w}{\partial y^2} + \frac{\partial^2 w}{\partial z^2} \right) \Big|_{(0,-1,1)} = ?$$

b) Given $z = f(x, y) = e^{x^2+y^2+xy}$, show that $f_{xy}(x, y) = f_{yx}(x, y)$.

Answer 4.