
Name :

Grade :

I) Calculate the following:

a) $\lim_{x \rightarrow 1^+} \frac{1}{1-x^2}$

b) $\int_0^{+\infty} e^{-x^2} dx$

c) $\frac{\partial f}{\partial x}$ where $f(x, y, z) = x^2 + \sin(y) e^{-z}$.

II) Matrix Algebra

(i) $\begin{bmatrix} 0 & 1 \\ 2 & 3 \end{bmatrix}^{-1} =$

(ii) $\begin{vmatrix} 2 & -3 \\ 4 & 1 \end{vmatrix} =$

(iii) $\begin{bmatrix} 0 & 1 \\ 2 & 3 \end{bmatrix} \cdot \begin{bmatrix} 0 & 1 \\ 2 & 3 \end{bmatrix} =$

(iv) $\begin{vmatrix} \cos(\vartheta) & -\sin(\theta) \\ \sin(\theta) & \cos(\theta) \end{vmatrix} =$

III) For which $x \in \mathbb{R}$ does the following series converge? For what $x \in \mathbb{C}$?

$$\sum_{k=0}^{\infty} (x-1)^k$$

IV) This was everything but ...

