

THE GURUKUL INSTITUTE

PLOT 5C, 2ND FLOOR, GANAPATI COMPLEX, SEC-13, OPP. JAIPURIA SCHOOL, VASUNDHRA, GHAZIABAD (U.P) PH NO. 9810780903
CLASS XII – MATHS UT -2

1. If $A = \begin{bmatrix} 1 & 1 & 2 \\ -1 & -2 & 1 \\ 1 & -2 & 3 \end{bmatrix}$ find A^{-1} . Hence solve the equations: $x - y + z = 4$, $x - 2y - 2z = 9$,
 $2x + y + 3z = 1$.
2. Prove that $\begin{vmatrix} a & b-c & c+b \\ a+c & b & c-a \\ a-b & b+a & c \end{vmatrix} = (a+b+c)(a^2 + b^2 + c^2)$.
3. Find the derivative of the following functions w.r.t x
 - a) $y = (x)^{\cos x} + (\sin x)^{\tan x}$.
 - b) $y = \log \sqrt{\frac{1+\sin^2 x}{1-\tan x}}$.
 - c) $y = \tan^{-1}\left(\frac{\sqrt{1+x^2}-1}{x}\right)$.
4. If $x = a\left(\frac{1+t^2}{1-t^2}\right)$ and $y = \frac{2t}{1-t^2}$, find $\frac{dy}{dx}$.
5. If $x = 2 \cos t - \cos 2t$ and $y = 2 \sin t - \sin 2t$, find $\left(\frac{d^2y}{dx^2}\right)$ at $t = \frac{\pi}{2}$.
6. Using the properties of determinants, evaluate the following: $\begin{vmatrix} 0 & ab^2 & ac^2 \\ a^2b & 0 & bc^2 \\ a^2c & cb^2 & 0 \end{vmatrix}$.
7. Evaluate: $\begin{vmatrix} \sin 30^\circ & \cos 30^\circ \\ -\sin 60^\circ & \cos 60^\circ \end{vmatrix}$.
- 8.