



b) Using Lagrange's interpolation formula find $f(6)$ from the following data :

x	3	7	9	10
$f(x)$	168	120	72	63

OR

13. a) Using Newton's divided difference table find $f(7)$ from the following data :

x	2	5	8	10	12
y	4.4	6.2	6.7	7.5	8.7

b) Evaluate $\int_{1}^{5} \log_{10} x \, dx$ by Trapezoidal rule dividing the interval $(1, 5)$ into 8 equal intervals.

a	e	6	12	2	5	7	x
0.1	0.5	1.2	2.5	5.0	7.5	12.5	(x)

OR

6. a) Prove that the surfaces $z = x^2 + y^2$ and $z = \sin(x+y)$ are orthogonal at the point $(1, 1, 2)$.

c	s	t	0	x
0	t	s	t	(x)

OR

b) If $v(r) = n(r) + \frac{1}{r}$ where $n(r) = \frac{1}{r} \int_1^r e^{-\frac{1}{s}} ds$, show that $v(r)$ is harmonic if $n'(r) = -1$.

c) Find the solution of the differential equation $\frac{dy}{dx} = \frac{x^2 + 3y^2}{x^2 - 3y^2}$ given that $y(1) = 1$.

$$\frac{dy}{dx} = \frac{x^2 + 3y^2}{x^2 - 3y^2}$$