Final Exam

Numerical Analysis (15 June 2021)

Answer the following questions.

Q 1: Use Euler's method with step size 0.3 to compute the approximate y-value $y(0.9)$ of the solution of the initial-value problem

$$\frac{dy}{dx} + x^2, \;\; y(0) = 1$$

Q 2: Use the Gauss-Seidal iteration method to approximate the solution to the system of equations given

$$83x + 11y - 4z = 95$$

$$7x + 52y + 13Z = 104$$

$$3x + 8y + 29z = 71$$

Q 3: Use Lagrange polynomial to estimate $f\ (3)$ and $f'(3)$ from the following given data.

x:	0	1	2	5
$f(x)$:	2	3	12	147

Q 4: Using newton's divided difference formula to find the value of $f(8), f(9)$and $f(15)$ from the following given data.

x:	4	5	7	10	11	13
$f(x)$:	48	100	294	900	1210	2028

Q 5: By use of Richardson extrapolation find $f'(x_3)$ with h=2, given function is $f'(x) = 2^x \ln\ |2|$

x :	1	2	3	4	5
$f(x)$:	2	4	8	16	32