

2. Show how to use Gaussian Quadrature to determine the value of the following integrals. Be specific.

a) $\int_{-1}^1 (2 - 3x^2 + 9x^4) dx$

b) $\int_2^6 (2 + 3\ln(x) - x^2) dx$

3. Find the integral for $f(x)dx$ from $x = 0$ to 1.6 using Simpson's 1/3 Rule.

x	0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6
f(x)	3	1	-2	-5	2	7	9	10	9

4. The rate of change of y with t is given below and that at $t = 0$, $y = 300$. Describe how to find y over the range $0 < t < 20$ by Runge-Kutta 4th Order. You may use an algebraic description, MathCad, MatLab, or any RK Solver but do identify your work.

$$\frac{dy}{dt} = -10 + 0.2t - 0.01y^2$$

5. Short Answer:
a) What is the purpose of Data Adjustment?

b) What is the mathematical basis of the method?

6. Below are several LP tableaus in various states of completion. Describe the next step for each.

a)

x	y	z	S1	S2	S3		F	RHS
5	3	2	1	0	0		0	1000
2	2	1	0	1	0		0	200
0	5	6	0	0	1		0	100
-60	-50	-2	0	0	0		1	0

b)

x	y	z	S1	S2	S3	A	F	RHS
5	4	2	1	0	0	0	0	1000
2	10	1	0	1	0	0	0	200
0	2	6	0	0	-1	1	0	100
-40	-50	-2	0	0	0	M	1	0

c)

x	y	z	S1	S2	S3	A	F	RHS
0	3	0	1	4	3	2	0	280
0	2	1	0	1	0	-5	0	52
1	5	0	0	0	1	3	0	21
0	50		0	35	5	14	1	4560

d) Circle the pivot in any of the above tableaus that are ready to use a pivot.

6. Layout the solution to the following set of equations using the Gauss-Seidel Method:

$$2x + y^2 - z^2 = -3$$

$$3x^3 + 2y - 4z = -1$$

$$x^2 - 7y^2 - z = -30$$