

Assignment #5 (MA6624)

Q1. Find an approximation to the solution of $x - e^x = 0$ using the data

x	0.3	0.4	0.5	0.6
e^x	0.740818	0.670320	0.606531	0.548812

Q2. For the following data,

x	0.0	0.2	0.4	0.6	0.8
$f(x)$	1.00	1.22140	1.49182	1.82212	2.22554

(a). Present a piecewise linear polynomial which interpolates the data. (b). Present a piecewise quadratic polynomial which interpolates the data. (c) Calculate $f(0.22)$ by the above two approximations, respectively.

Q3. Fit the following data by a linear function $y = ax + b$.

x	2.10	6.22	7.17	10.52	13.68
y	2.90	3.83	5.98	5.71	7.74

and

x	2.10	6.22	7.17	10.52	13.68
y	2.90	3.83	6.98	5.71	7.74

Q4. Fit the following data by a quadratic function $y = a + bx + cx^2$.

x	2	4	6	8	10
y	3.07	12.85	31.47	57.37	91.29

Q5. Find a least squares solution for the following over-determined system

$$\begin{aligned}x + y &= 1 \\x + 2y &= 3 \\x + 3y &= 1.\end{aligned}$$