

1. The following table is obtained from the polynomial $y = x^2 - 2$

x		0	1	2
y		-2	-1	2

Consider the inverse data

y		-2	-1	2
x		0	1	2

- (a) Using the Lagrange interpolation method, find the polynomial $x = g(y)$ which interpolates the inverse data and compute $r = g(0)$ as an approximation to $\sqrt{2}$, with five decimal-digit arithmetic.
- (b) Using Newton's interpolation method, find the polynomial $x = g(y)$ which interpolates the inverse data and compute $r = g(0)$ as an approximation to $\sqrt{2}$, with five decimal-digit arithmetic.
2. Determine constants a , b , c , and d that will produce a quadrature formula

$$\int_{-1}^1 f(x)dx = af(-1) + bf(1) + cf'(-1) + df'(1)$$

that has degree of precision (or accuracy) 3.

3. A natural cubic spline S on $[0, 2]$ is defined by

$$S(x) = \begin{cases} 1 + 2x - x^3, & \text{if } 0 \leq x < 1, \\ 2 + ax + bx^2 + cx^3, & \text{if } 1 \leq x \leq 2. \end{cases}$$

Find a , b , and c .

The End