Name: Solutions

Let $L(x)$ be the linear spline function interpolating the points (1,2), (2,4), and (4,2).

1. Find the values of $L(1.5)$ and $L(2.5)$.

For $1 < x < 2$, $L(x) = 2 + \frac{4-2}{2-1}(x-1)$

$\Rightarrow L(1.5) = 3.$

For $2 < x < 4$, $L(x) = 4 + \frac{2-4}{4-2}(x-2)$

$\Rightarrow L(2.5) = 3.5.$

2. Discuss the trade-offs of using a linear spline as opposed to an interpolating polynomial.

Advantages of Linear Spline:

- Simple, lower computational cost
- Non-oscillatory

Advantages of Interpolating Polynomial:

- Regularity
- Accuracy