Worksheet 2/13/2026

1) Check if the function is a spline function. If it is, what is its degree?

(a) $f(x) = \begin{cases} 2x + 1, & 0 \le x \le 1 \\ 3x, & 1 < x \le 2 \end{cases}$

(b) $f(x) = \begin{cases} x^2, & 0 \le x \le 1 \\ 2x^2 - x, & 1 < x \le 2 \end{cases}$

(c) $f(x) = \begin{cases} -x, & -1 \le x \le 0 \\ x^2, & 0 < x \le 1 \end{cases}$

2) Find the following type of spline function through three points $(0, 1), (1, 3), (2, 2)$.

(a) Linear spline

(b) Quadratic spline

(c) Quadratic spline but now with an additional data point $(3, 2)$.