1. Determine which of the following functions are cubic splines

   (a) $f(x) = \begin{cases} 3x^3 - 4x + 1 & \text{for } 0 \le x \le 1 \\ x^3 + x^2 - 2 & \text{for } 1 \le x \le 2 \end{cases}$

   (b) $f(x) = \begin{cases} x^2 - 3 & \text{for } 1 \le x \le 2 \\ (x-2)^3 + x^2 - 3 & \text{for } 2 \le x \le 3 \end{cases}$

2. Determine a, b, c, d and e so that S is a natural cubic spline

   $$S(x) = \begin{cases} a(x-2)^3 + b(x-2)^2 + c(x-2) + d & \text{for } 1 \le x \le 2 \\ (x-2)^3 + ex^2 & \text{for } 2 \le x \le 3 \end{cases}$$

3. Find a natural cibic spline interpolating the table

x	0	1	2	4	5	6
y	1	0	2	0	1	2

Computer assignment

1. Use the MATLAB function spl3.m to find a natural cibic spline interpolating the table:

x	-3	-2	-1	0	1	2
y	11.1	4.2	-2.2	-2.8	0.1	6.8