**Exercise 1. Lagrange polynomials.**
1. Find the polynomial $P$ of degree less or equal to 4 s.t.
   \[ P(0) = 1, \quad P(1) = 2, \quad P(-1) = 2, \quad P(2) = 17, \quad P(-2) = 17. \]
2. Find the polynomial $P$ of degree less or equal to 5 s.t.
   \[ P(0) = 1, \quad P(1) = 2, \quad P(2) = 3, \quad P(3) = 4, \quad P(4) = 5, \quad P(5) = 6, \quad P(6) = 7. \]

**Exercise 2. Bernstein polynomials**
For a fixed $n$, we define the Bernstein polynomials
\[ P_i(x) = \binom{n}{i} x^i (1-x)^{n-i}, \quad i = 0, \ldots, n. \]
Show that they form a basis for polynomials of degree less or equal to $n$. 