1. Suppose that $x_0 < x_1 < \cdots < x_n$ and $y_0, y_1, \ldots, y_n$ are given real numbers. Then there exists a unique polynomial $p \in \mathcal{P}_n$ such that $p(x_i) = y_i$ for all $i \in \{0, \ldots, n\}$.

2. Suppose that $f\colon [-1,1] \to \mathbb{R}$ is given by $f(x) = \mathrm{e}^{-2x}$, and for any $n \in \mathbb{N}$, let $f_n \in \mathcal{P}_n$ denote the polynomial interpolating f at $n+1$ equidistant points $-1 = x_0 < x_1 < \ldots < x_n = 1$. Then

$$\lim_{n\to\infty} \left(\max_{-1\leqslant x\leqslant 1} \bigl|f(x) - f_n(x)\bigr| \right) = 0.$$

3. Define $\mathcal{F}\colon \mathcal{P}_n \to \mathbf{R}$ as the function which, to a polynomial $p \in \mathcal{P}_n$, associates its maximum absolute value over the interval $[-1,1]$, that is

$$\mathcal{F}(p) = \max_{x\in[-1,1]} |p(x)| \, .$$

   Then it holds that $\mathcal{F}(p) \geqslant \mathcal{F}(T_n)$ for all $p \in \mathcal{P}_n$, where T_n is the Chebyshev polynomial of degree n.

4. Suppose that $f\colon [-1,1] \to \mathbb{R}$ is the Runge function $f(x) = \frac{1}{1+25x^2}$. For any $n \in \mathbb{N}$, let $f_n \in \mathcal{P}_n$ denote the polynomial interpolating f at $n+1$ *equidistant* points, and let $g_n \in \mathcal{P}_n$ denote the polynomial interpolating f at the $n+1$ *Chebyshev* points (the roots of T_{n+1}). Then it holds that

$$\lim_{n\to\infty} \left(\max_{-1\leqslant x\leqslant 1} \bigl|f(x) - f_n(x)\bigr| \right) = +\infty \, , \qquad \lim_{n\to\infty} \left(\max_{-1\leqslant x\leqslant 1} \bigl|f(x) - g_n(x)\bigr| \right) = 0 \, .$$

5. Suppose that $x_0 < x_1 < \cdots < x_n$ and $y_0, y_1, \ldots, y_n$ are given real numbers. Then for any $m \in \{0, 1, \ldots\}$, there exists exactly one polynomial $p \in \mathcal{P}_m$ such that

$$\frac{1}{n} \sum_{i=1}^{n} \Bigl|p(x_i) - y_i\Bigr|^2 = 0.$$

6. Given $x_0 < x_1 < \ldots < x_n \in \mathbb{R}$ and $y_0, y_1, \ldots, y_n \in \mathbb{R}$, and let $m \geqslant n$. There exists a unique $p \in \mathcal{P}_m$ such that the following quantity is minimized:

$$\frac{1}{n} \sum_{i=1}^{n} \Bigl|p(x_i) - y_i\Bigr|^2 = 0.$$

7. Given $x_0 < x_1 < \ldots < x_n \in \mathbb{R}$ and $y_0, y_1, \ldots, y_n \in \mathbb{R}$ with $n = 10$, there exists a unique polynomial $p(x) = ax + b$ that minimizes

$$J(a,b) = \frac{1}{2} \sum_{i=1}^{n} \Bigl|y_i - p(x_i)\Bigr|^2.$$

8. In Julia, if `v` is a vector of size 5, then `v[[1, 2, 5]]` returns a vector with the first, second and fifth element of `v`.

9. In Julia, if `v` is a vector of size 5, then `v[[true, true, false, true, false]]` returns a vector with the first, second and fourth element of `v`.

10. In Julia, if `A` is a 10×10 matrix, then `A[mod.(1:end, 2) .== 0, mod.(1:end, 2) .== 0]` gives the matrix obtained by removing the second column and the second row.