I. Functions

$$\operatorname{rect}(t) = \mathbb{1}\left(|t| < \frac{1}{2}\right) \tag{1}$$

$$\operatorname{sinc}(t) = \frac{\sin(t)}{t} \tag{2}$$

II. Fourier Transform

$$X(f) = \int_{-\infty}^{\infty} x(t) e^{-2\pi j f t}\,\mathrm{d}t \tag{3}$$

$$\operatorname{sinc}\left(\frac{t}{T_s}\right) \qquad \frac{1}{F_s}\operatorname{rect}\left(\frac{f}{F_s}\right) \tag{4}$$

III. Sampling of Bandlimited Function

$$x[n] = \left\langle \operatorname{sinc}\left(\frac{t - nT_s}{T_s}\right), x(\cdot) \right\rangle = T_s x(nT_s) \tag{5}$$

$$x(t) = \frac{1}{T_s} \sum_{n=-\infty}^{\infty} x[n] \operatorname{sinc}\left(\frac{t - nT_s}{T_s}\right) \tag{6}$$

IV. Lagrange Polynomials

$$L_n^{(N)}(t) = \prod_{k=-N, k\neq n}^{N} \frac{t-k}{k-n}, \quad n = -N, \ldots, N \tag{7}$$

Property:

$$L_n^{(N)} = \begin{cases} 1 & t = n \\ 0 & t \in \mathbf{Z} \setminus n \end{cases}$$