1/ $f(s) = s^2, \quad T = 1$

$$I(f, T) = \lim_{n \to \infty} \sum_{i=0}^{n-1} \frac{i^2}{n^2} \left(B_{\frac{i+1}{n}} - B_{i/n} \right)$$

2/ $f(s) = B_s^2, \quad T = 1$

$$I(f, T) = \lim_{n \to \infty} \sum_{i=0}^{n-1} B_{i/n}^2 \left(B_{\frac{i+1}{n}} - B_{i/n} \right)$$

$$I(f,T) = \int_0^T f(s)\,dB_s$$

$$\Pi_n = \left\{ 0, \frac{T}{n}, \frac{2T}{n}, \dots, T \right\}$$

$$\delta_{f,T}^{(n)} = \begin{cases} f(0) & s \in [0, T/n) \\ f(T/n) & s \in [T/n, 2T/n) \\ \\ f((n-1)T/n) & s \in \left[\frac{(n-1)T}{n}, T\right) \end{cases}$$

$$I_n(f,T) = \int_0^T \delta_{f,T}^{(n)} \, dB_s =$$

$$= \sum_{i=0}^{n-1} f\left(\frac{iT}{n}\right)\left[B_{\frac{(i+1)T}{n}} - B_{\frac{iT}{n}}\right]$$

$$\Rightarrow I(f,t) = \lim_{n\to\infty} I_n(f,t)$$

$$= \lim_{n\to\infty} f\left(\frac{iT}{n}\right)\left[B_{\frac{(i+1)T}{n}} - B_{\frac{iT}{n}}\right].$$