$$\mathbb{P}(|\sup f(t)| > x) \qquad x>0$$

$$= \mathbb{P}(\sup f(t) > x) + \mathbb{P}(\sup f(t) < -x)$$

$$\leq 2\mathbb{P}(\sup f(t) > x)$$

$$\mathbb{E}X = \int_{x=-\infty}^{\infty} \mathbb{P}(X > x)\, dx$$

$$\| \qquad X = \begin{cases} 1 - F(x) \\ = \mathbb{P}(X \leq x) \end{cases}$$

$$\int_{-\infty}^{\infty} x f(x)\, dx \qquad 1 - F(x)$$

$$X = \int_0^X dt \quad 1[X>0] = \int_0^{\infty} 1[X>t]\, dt$$

$$+ \int_{-\infty}^{0} \qquad 1[X \leq 0]$$