Για X συνεχή, μη αρνητική τμ, σκ $F_X(\cdot)$, σπп $f_X(\cdot)$, $E(T)<\infty$

$$E(X) = \int_0^\infty [1-F_X(x)]\,dx.$$

Πράγματι

$$\int_0^\infty [1-F_X(x)]\,dx = \int_0^\infty P(X>x)\,dx = \int_0^\infty \int_x^\infty f_X(u)\,du\,dx =$$

$$= \int_0^\infty \int_0^u f_X(u)\,dx\,du = \int_0^\infty f_X(u)\left(\int_0^u dx\right)du = \int_0^\infty u\,f_X(u)\,du$$

$$= E(X)$$

Ας βρούμε την $E(\min(X, x))$

$Y = \min(X, x)$, Y τμ

$$E(Y) = \int_0^\infty P(Y > t)\,dt = \int_0^\infty P(\min(X, x) > t)\,dt =$$

$$= \int_0^\infty P(X > t,\ x > t)\,dt = \int_0^\infty P(X > t)\,\mathbb{1}_{\{x > t\}}\,dt$$

$$= \int_0^x P(X > t)\,dt$$