

$$f(x) = \begin{cases} kx^{-\frac{1}{2}} & 0 < x < 1 \\ 0 & \text{altrove} \end{cases} \quad k \in \mathbb{R}$$

$$k = \int_{-\infty}^{+\infty} f(x) dx = 1$$

$$= \int_0^1 kx^{-\frac{1}{2}} dx$$

$$= k \int_0^1 x^{-\frac{1}{2}} dx$$

$$= k [2\sqrt{x}]_0^1$$

$$= k [2 - 0]$$

$$= k \cdot 2$$

$$= k = \frac{1}{2}$$

② Funzione di Densità

$$F(x) = \int_{-\infty}^x f(t) dt$$

$$= \int_0^x kx^{-\frac{1}{2}} dx$$

$$= k \int_0^x x^{-\frac{1}{2}} dx$$

$$= \frac{1}{2} [2\sqrt{x}]_0^x$$

$$= \frac{1}{2} [2\sqrt{x} - 0]$$

$$= \frac{1}{2} x \sqrt{x}$$

$$= \sqrt{x}$$

$$= x^{\frac{1}{2}}$$

$$F_X(x) = \begin{cases} 0 & x < 0 \\ x^{\frac{1}{2}} & 0 \leq x \leq 1 \\ 1 & x > 1 \end{cases}$$

Media

$$E(X) = \int_{-\infty}^{+\infty} F(x) \cdot x \, dx$$

$$\int_0^1 x^{\frac{1}{2}} \cdot x \, dx$$

$$K \left[\frac{\kappa^{\frac{3}{2}}}{\frac{3}{2}} \right]^G_1$$

$$= \frac{1}{\cancel{2}} \cdot \frac{2}{3}$$

$$= \left(\frac{3}{3} \right)$$

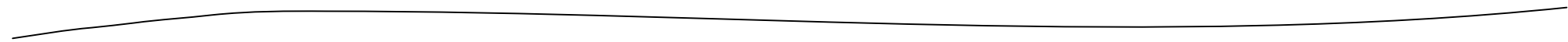
$$E(x^2) = \int_{-\infty}^{+\infty} F(x) \cdot x^2 dx$$

$$= \int_0^1 x^{\frac{3}{2}} dx$$

$$= \frac{1}{2} \left[\frac{2 x^{\frac{3}{2}} \sqrt{x}}{5} \right]_0^1$$

$$= \frac{1}{2} \left[\frac{2 \cdot 1^{\frac{3}{2}} \sqrt{1}}{5} - \frac{2 \cdot 0^{\frac{3}{2}} \sqrt{0}}{5} \right]$$

$$= \frac{1}{2} \cdot \frac{2}{5}$$



VAR, AUZA

$$E(x)^2 - (E(x))^2$$

1 1 1 2

$$V_{\text{avr}}(x) = \frac{1}{5} - \left(\frac{1}{3}\right)^2$$

$$= \frac{1}{5} - \frac{1}{9}$$

$$= \frac{4}{45}$$

$$= \frac{4}{45}$$

$$Y = |X|^{\frac{1}{2}}$$

$$F_Y = P(Y \leq y)$$

$$F_Y = P(|X|^{\frac{1}{2}} \leq y) = P(X \leq y^2) = (y^2)^{\frac{1}{2}} = y$$

$$F_y(y) = \begin{cases} 0 & y < 0 \\ y & 0 \leq y < 1 \\ 1 & y \geq 1 \end{cases}$$

Funzione di Densità

$$f(y) = \frac{d}{dy} F_y$$

$$= \frac{d}{dy} y$$

$$\boxed{= \mathbb{I}}$$

$$p(y) \begin{cases} \mathbb{I} \\ \odot \end{cases}$$

$$\odot \sim y \lesssim \mathbb{I}$$

above