Serie 4

Ex 1

$$f(x) = \begin{cases} \frac{K}{x^3} & \text{si } x \geq 1 \\ 0 & \text{si } x < 1 \end{cases}$$

a) Valeur de K

$$\int_{-\infty}^{\infty} f(x)\,dx = \int_{1}^{\infty} \frac{K}{x^3}\,dx - \int_{-\infty}^{0} 0\,dx$$

$$= K\left[\frac{1}{\frac{x^2}{-2}}\right]_1^{\infty} - 0$$

F(x)

F(x) est sensé d'être égal à 1

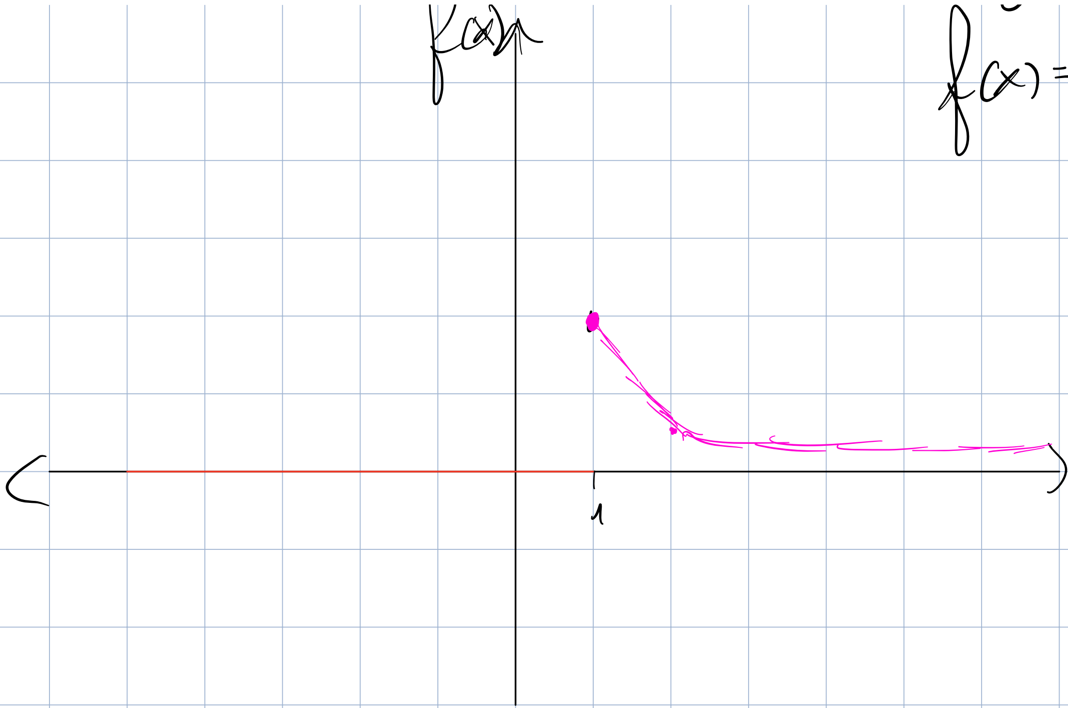
$$= \cancel{K \cdot 0} + K\frac{1}{2} = \frac{K}{2}$$

$$F(x) = \frac{K}{2} \Rightarrow 1 = \frac{K}{2}$$

$$K = 2$$

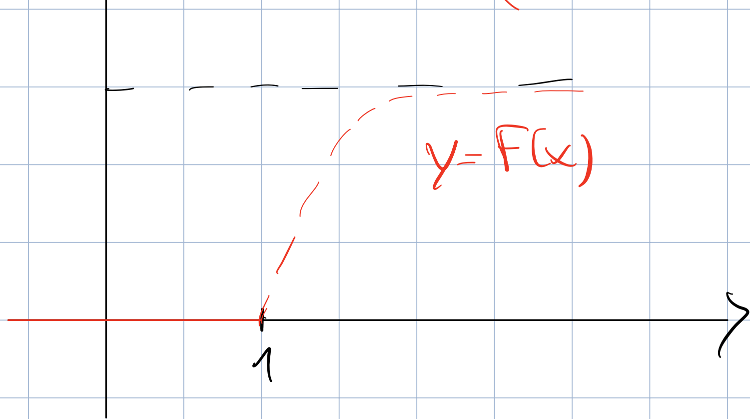
lim

$f(x) = \frac{2}{x^3}$



b) $F(x) = ?$ $\quad F(x) = P(X \le x) = \int_{-\infty}^{x} f(t)\,dt$

$$2\int_1^x \frac{1}{t^3}\,dt = \cancel{2}\,\frac{t^{-2}}{-\cancel{2}}\Big|_1^x = 1 - x^{-2} = 1 - x^{-2}$$



$$F(x) \begin{cases} 0 & \text{si } x < 1 \\ 1 - x^{-2} & \text{si } x \ge 1 \end{cases}$$

$$\int \frac{c}{t^3}\,dt$$

c) $P(3 \leq x \leq \infty) = \int_3^\infty f(x)$

$$\int_3^\infty \frac{2}{x^3}\,dx + \cancel{\int_{-\infty}^{3} 0\,dx}$$

$$\left[\overset{2}{k} \cdot \frac{1}{\frac{x^2}{-2}}\right]_3^\infty = \cancel{k \cdot \frac{1}{0}} + \cancel{2} \cdot \frac{1}{\cancel{-2}\,3} = \frac{1}{9}$$

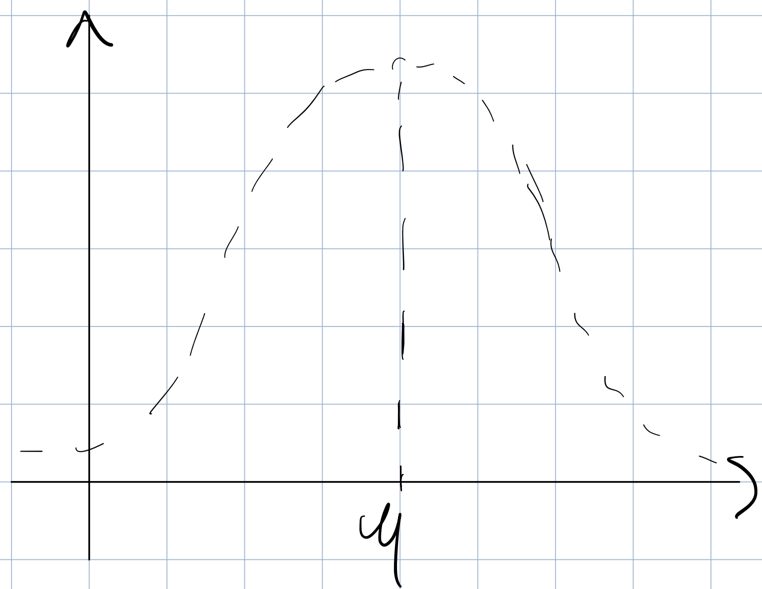
d) $E(x) = \int_{-\infty}^{+\infty} x\, f(x)$

$$= \int_1^\infty x \cdot \frac{2}{x^3}\,dx + \cancel{\int_{-\infty}^{0} x \cdot 0}$$

$$= 2\left[\frac{-1}{x}\right]_\infty^1 = 2 \text{ ans}$$

d) *

Ex 2



$\mu = 199 \qquad \sigma = 8$

$$P(x \leq x) = 1 - P(x \geq \ )$$

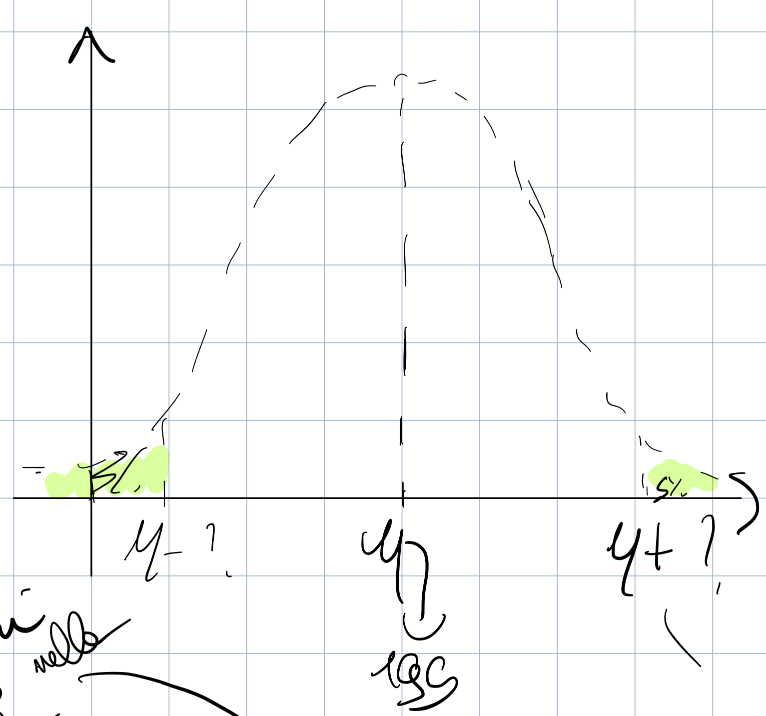
$$= 1 - P\left(z \geq \frac{x - \mu}{\sigma}\right)$$

$$= 1 - P\left(z \geq \frac{210 - 199}{8}\right)$$

$$= 1 - P(z \geq 1{,}37)$$

$= 1 - 0,91466 = 0,085$

b)



Cerchi 0,95 nella tavola

$$P(z \le 1,65) = 1 - 0,05$$

$$z = \frac{x - \mu}{\sigma} \qquad 1,65 = \frac{x - 199}{8}$$

x trovare i negativi

$$-(1,65 \cdot 8) + 199 = x$$

△ taglia massima dei giocatori + piccoli

$$x = 185,8$$

1d) $E(x) = \int_{-\infty}^{\infty} x\, f(x) = \int_{1}^{\infty} \cancel{x} \cdot \frac{2}{x^{\cancel{3}2}}$

$$= -\frac{2}{x}\Big|_{1}^{\infty} = 0 - \left(-2\right) = 2$$