$$\langle x \rangle = \frac{1}{T}\int_0^T x(t).dt \qquad \langle x^2 \rangle = \frac{1}{T}\int_0^T x(t)^2.dt.$$

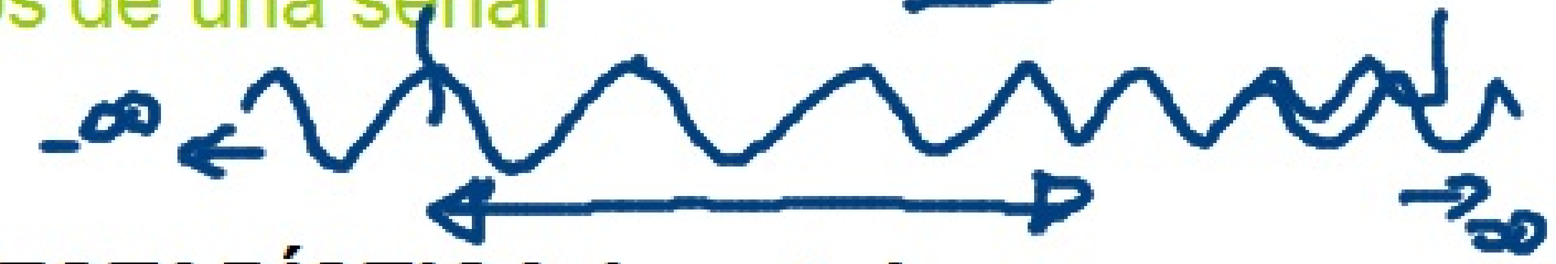
$$\bar{x} = \int_{-\infty}^{+\infty} x.p(x).dx \qquad \overline{x^2} = \int_{-\infty}^{+\infty} x^2.p(x).dx$$

$$\sigma^2 = \overline{x^2} - \left(\bar{x}\right)^2$$ **Varianza**

$$\sigma = \sqrt{\overline{x^2} - \left(\bar{x}\right)^2}$$ **Desviación standard** $+\cos(\pi.2.f)$

$$V = 220.\sqrt{2}.\cos(50.2\pi t)$$

Relación con los valores eléctricos de una señal



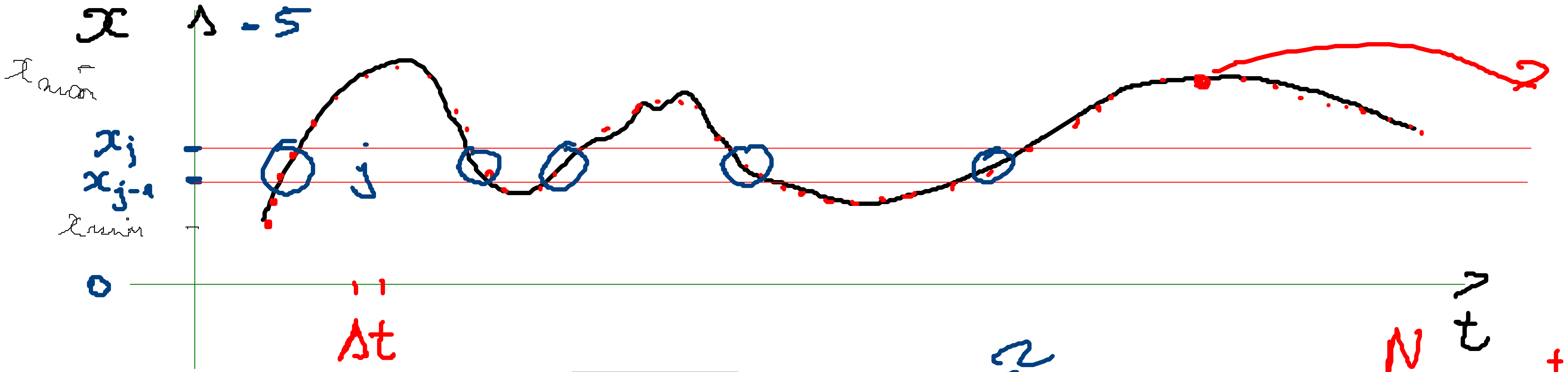
PROMEDIOS TEMPORALES Y ESTADÍSTICA de señales eléctricas

¿siempre se cumplen las siguientes igualdades ?. Bajo qué condiciones se cumplen ?

Promedio Temporal

$$\langle x \rangle = \bar{x} \qquad \langle x^2 \rangle = \overline{x^2}$$

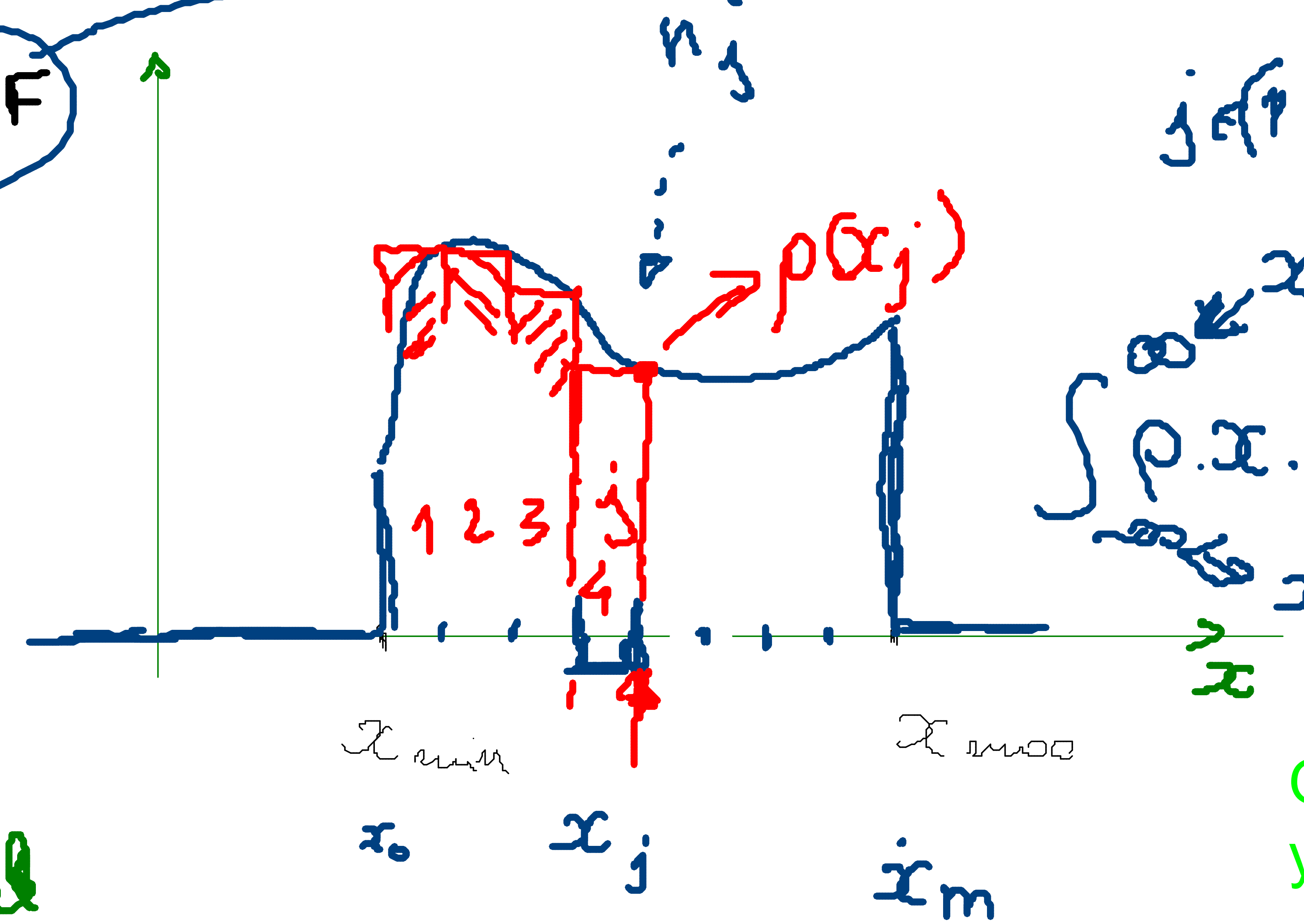
Procesos ergódicos: qué son ???



$N_{muestras}$

$P_j = \frac{n_j}{N}$

pdF



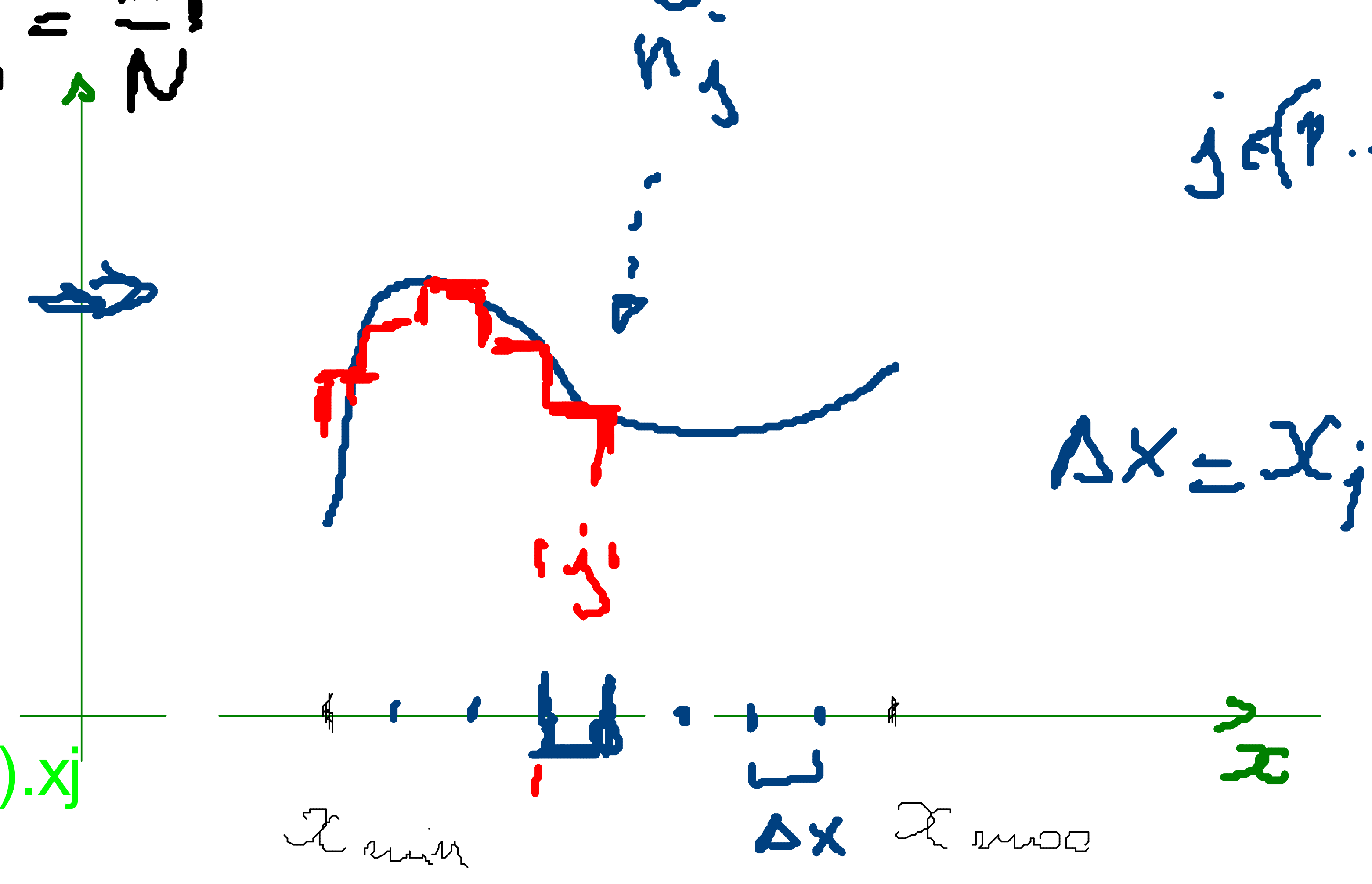
$j \in (1 \dots m)$

$$\int_{x_{min}}^{x_{max}} p.x.dx = 1$$

$P_j = \frac{n_j}{N}$

~~pdF~~

Histograma



$j \in (1 \dots m)$

$\Delta x = x_j - x_{j-1}$

Ojo!!, es p(x), no p.x
y p(xj) en vez de p(xj).xj

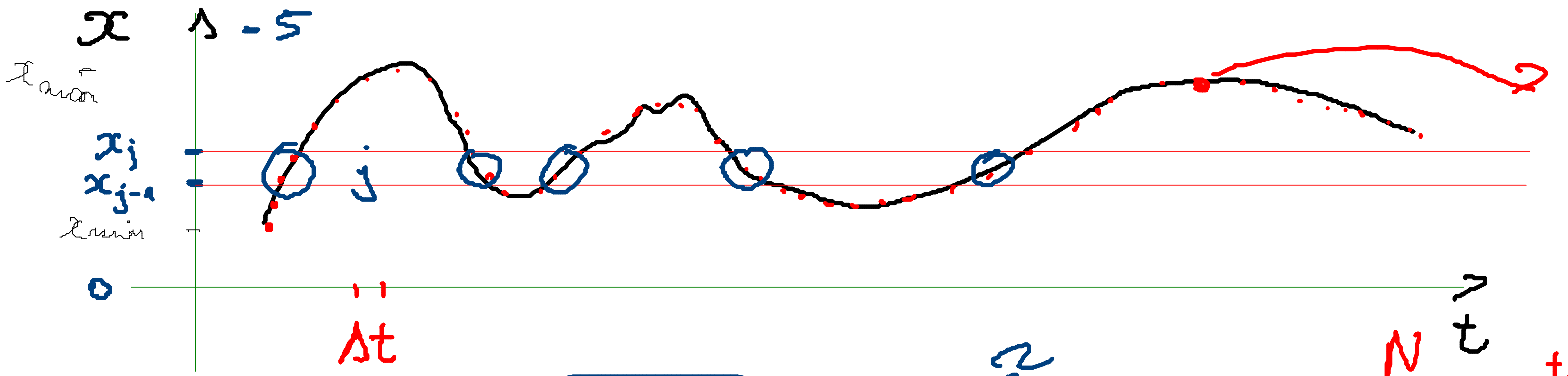
Ideal

$$P(x_{j-1} < x < x_j) = \int_{x_{j-1}}^{x_j} \boxed{p.x}\, dx$$

Aprox

$$P_j \simeq \int_{x_{j-1}}^{x_j} \boxed{p(x_j).x_j}\, dx$$

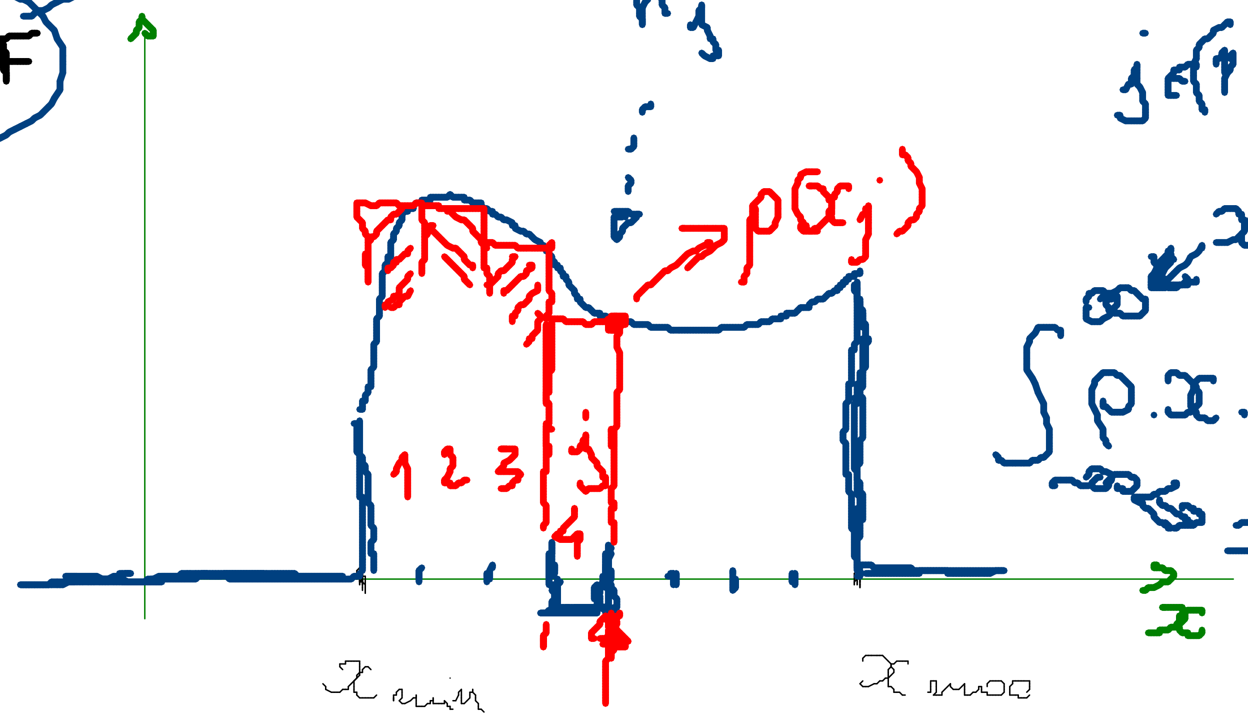
$$\sum_{j=1}^{m} P_j . \Delta x \quad \vdots \quad \Delta x . \sum_{1}^{m} P_j = \Delta x$$



$N_{muestres}$

$$P_j = \frac{n_j}{N}$$

pdF ≈ Histograma

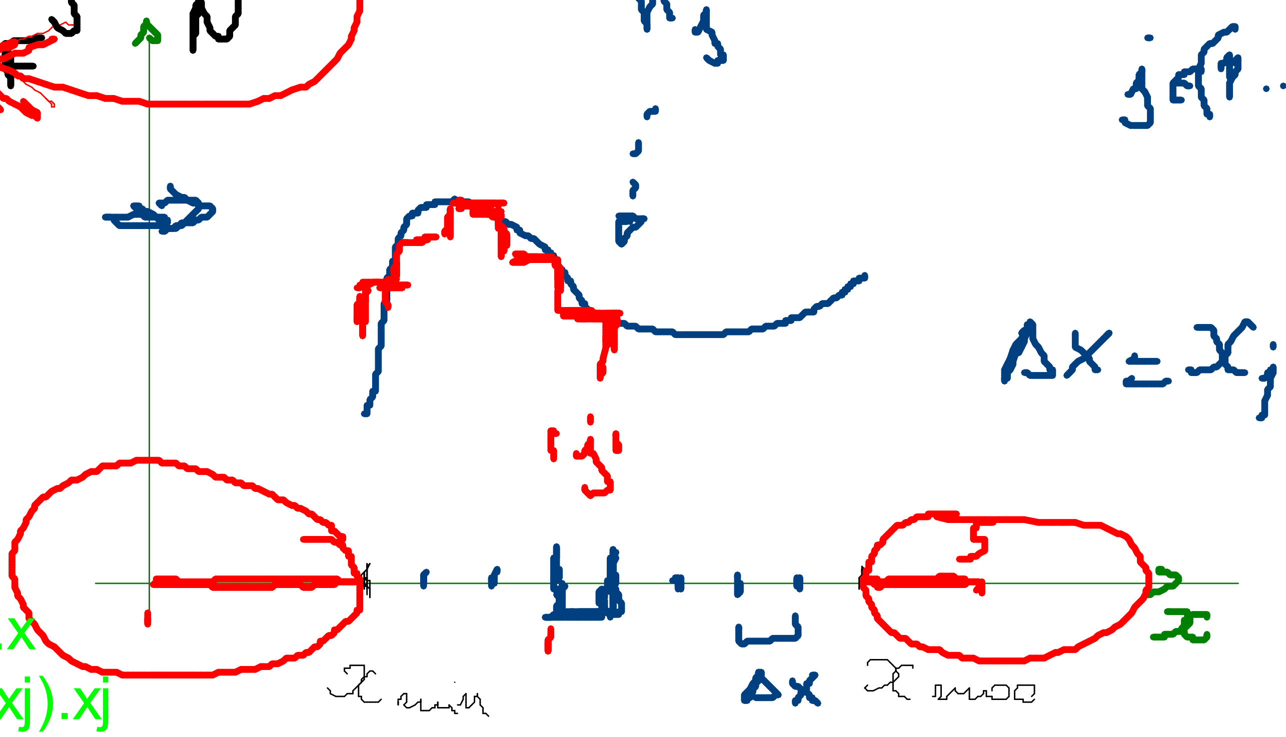


$j \in (1 \dots m)$

$$\int_{-\infty \; x_{min}}^{\infty \; x_{max}} p.x.dx = 1$$

$$P_j = \frac{n_j}{N}$$

~~pdF~~



$j \in (1 \dots m)$

$$\Delta x = x_j - x_{j-1}$$

Ideal

Ojo!!, es p(x), no p.x
y p(xj) en vez de p(xj).xj

$$\rightarrow P(x_{j-1} < x < x_j) = \int_{x_{j-1}}^{x_j} p.x \; dx$$

Aprox

$$\rightarrow P_j \approx \int_{x_{j-1}}^{x_j} p(x_j).x_j \; dx$$

$$1 \neq \sum_{j=1}^{m} P_j \cdot \Delta x \qquad \Delta x \cdot \sum_{1}^{m} P_j = \Delta x \cdot \frac{1}{N} \sum_{j=1}^{m} n_j = \Delta x \cdot 1$$

N

$$\frac{n_j}{N} \qquad \frac{n_j}{N} \cdot \frac{1}{\Delta x}$$

$$\Delta x = \frac{x_{max} - x_{min}}{8}$$

$$\Delta x = \frac{5 - 0}{2^7}$$