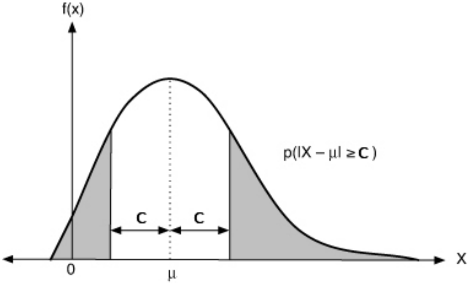
Desigualdad de Chebyshev

$$P\left(|X - E(X)| > c\right) \leq \frac{\mathrm{Var}(X)}{c^2}$$

$$\begin{aligned}
\mathrm{Var}(X) = \int_{-\infty}^{\infty} (t-\mu)^2 f_X(t)\ \mathrm{d}t &\geq \int_{-\infty}^{\mu-c} (t-\mu)^2 f_X(t)\ \mathrm{d}t + \int_{\mu+c}^{\infty} (t-\mu)^2 f_X(t)\ \mathrm{d}t \\
&\geq \int_{-\infty}^{\mu-c} c^2 f_X(t)\ \mathrm{d}t + \int_{\mu+c}^{\infty} c^2 f_X(t)\ \mathrm{d}t \\
&= c^2 \left[\int_{-\infty}^{\mu-c} f_X(t)\ \mathrm{d}t + \int_{\mu+c}^{\infty} f_X(t)\ \mathrm{d}t \right] \\
&= c^2 \left[P\left(X < \mu - c\right) + P\left(X > \mu + c\right) \right] \\
&= c^2 \left[P\left(X - \mu < -c\right) + P\left(X - \mu > c\right) \right] = c^2\, P\left(|x - \mu| > c\right)
\end{aligned}$$


f(x)
p(|X – μ| ≥ C)
C
C
0
μ
X