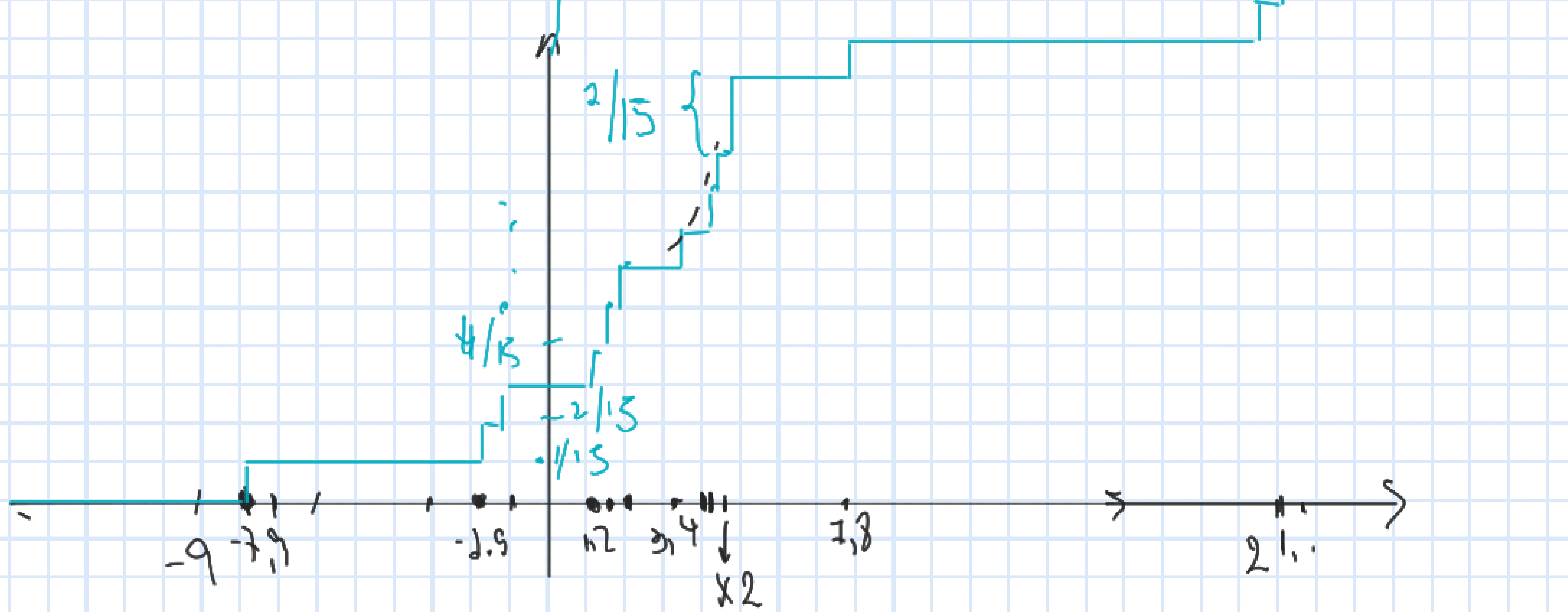
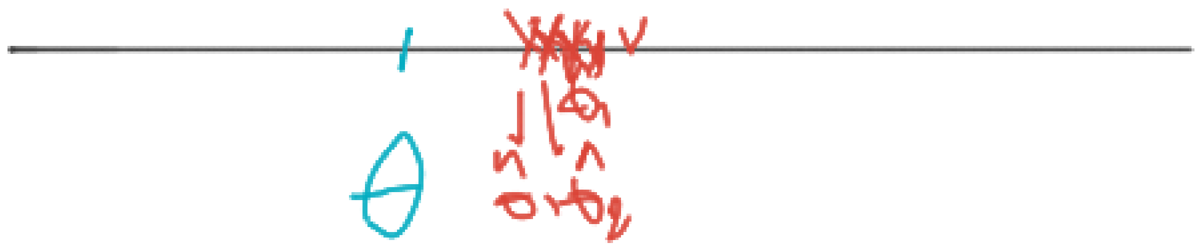
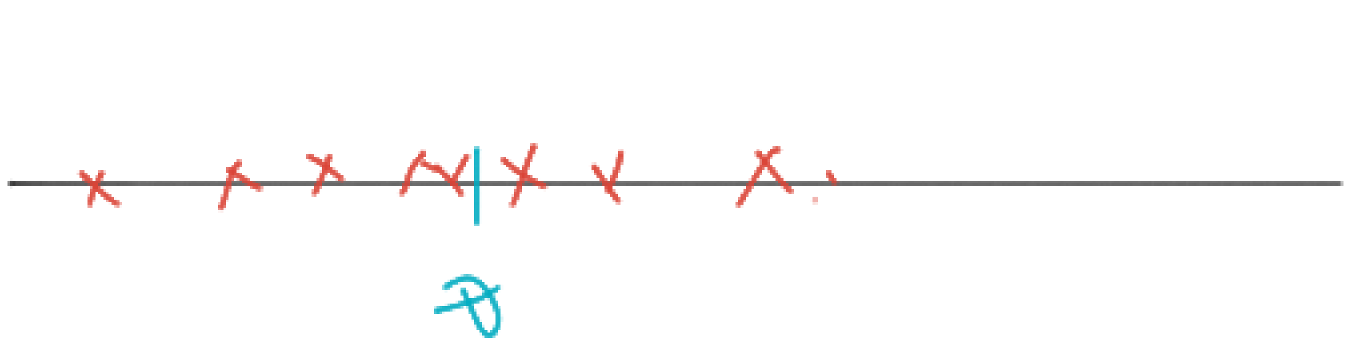
Ej 1

~~1.2~~, ~~1.6~~, ~~4.3~~, ~~4.2~~, ~~-7.9~~, 7.8, ~~3.4~~, ~~19.8~~, 25.5, ~~4.9~~, ~~2.1~~, ~~-0.9~~, ~~4.6~~, 21.1, ~~1.7~~

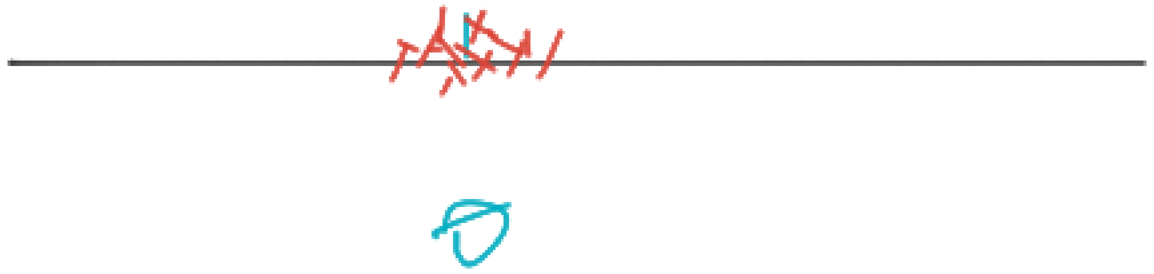




↑ sesgo ↓ varianza

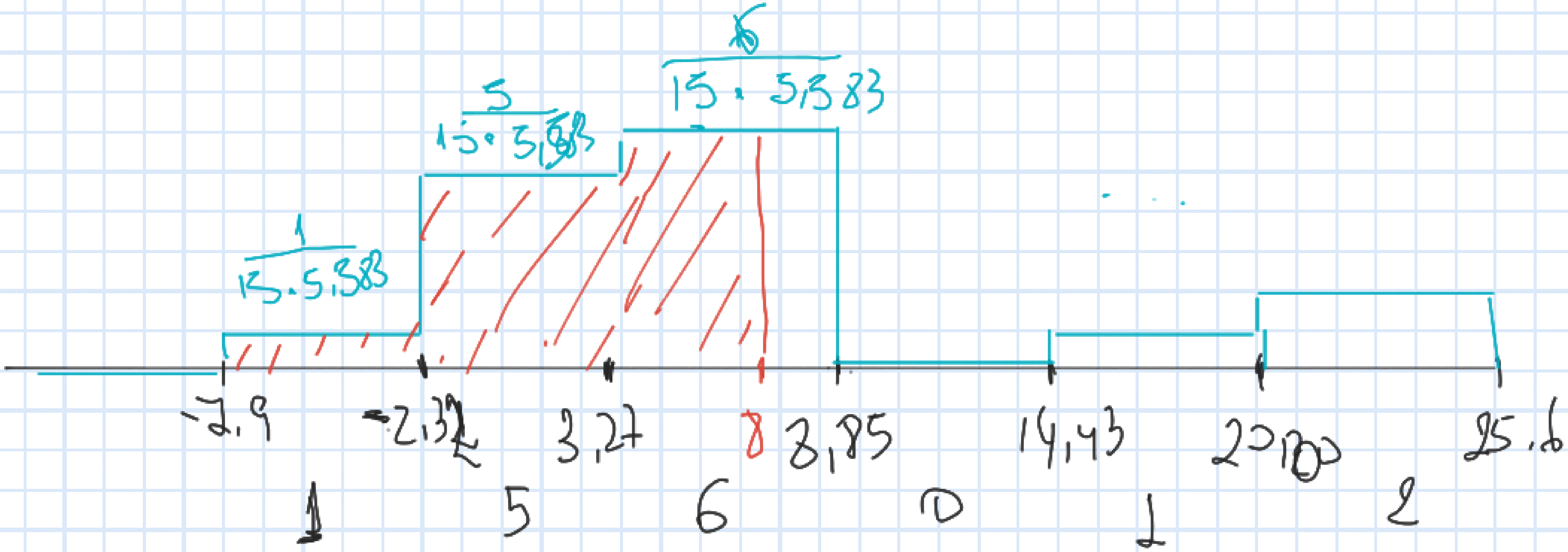


↓ sesgo ↑ varianza



↓ sesgo ↓ varianza

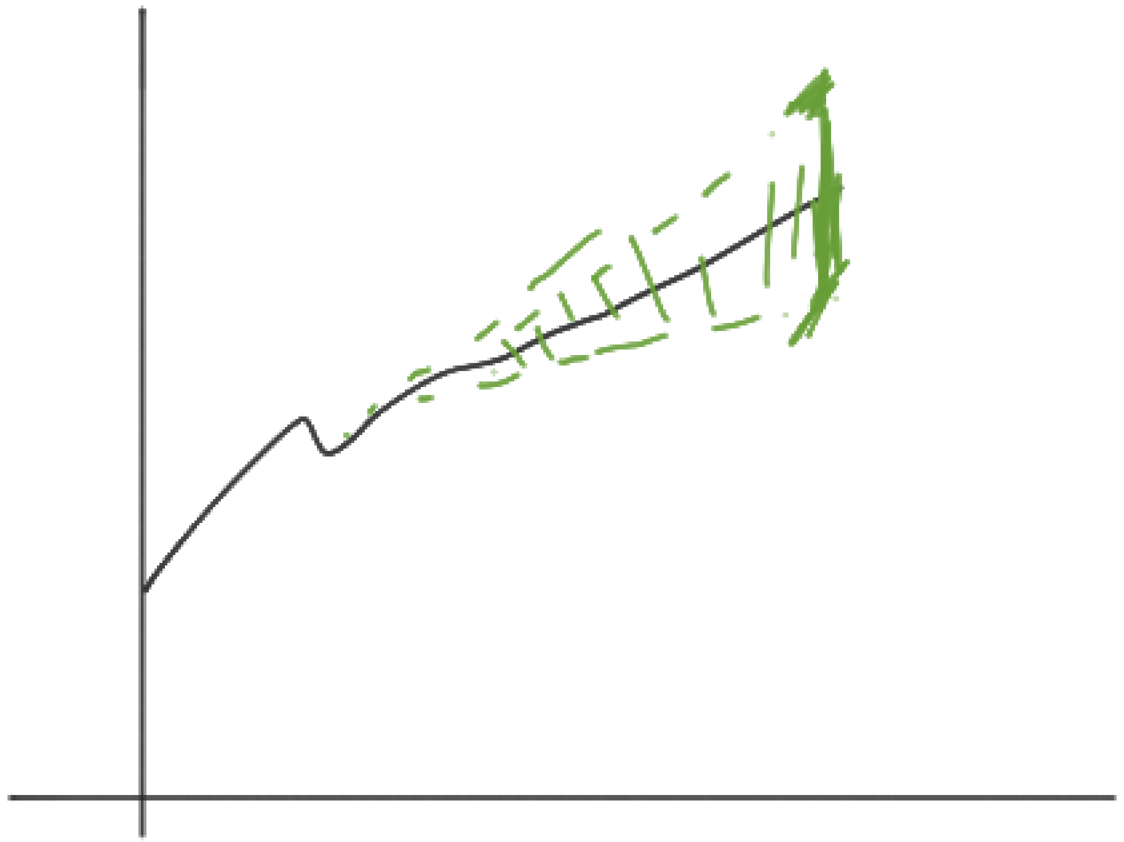
1.2, 4.6, 4.3, 4.2, -7.9, 7.8, 3.4, 19.8, 25.5, -1.9, 2.1, -0.9, 4.6, 21.1, 1.7



$m = 15 \qquad h = 5{,}383$

$\mathbb{P}(X \le 8) =$

$\mathbb{P}(9 < X < 12) = 0$



β_1 0,94 [0,83 , 2,04]

ECM

X una r.a. $\quad X \sim N(\mu, \underset{\hookrightarrow \text{var}}{4})$. $\underline{X} = (X_1, \dots, X_n)$ $X_i \overset{iid}{\sim} X$

Hallar un IC de nivel de confianza 0.95 para μ

$$\hat{\mu} = \frac{1}{n}\sum_{i=1}^{n} X_i = \overline{X} \qquad \overline{X} \sim N(\mu, 4/n)$$

id

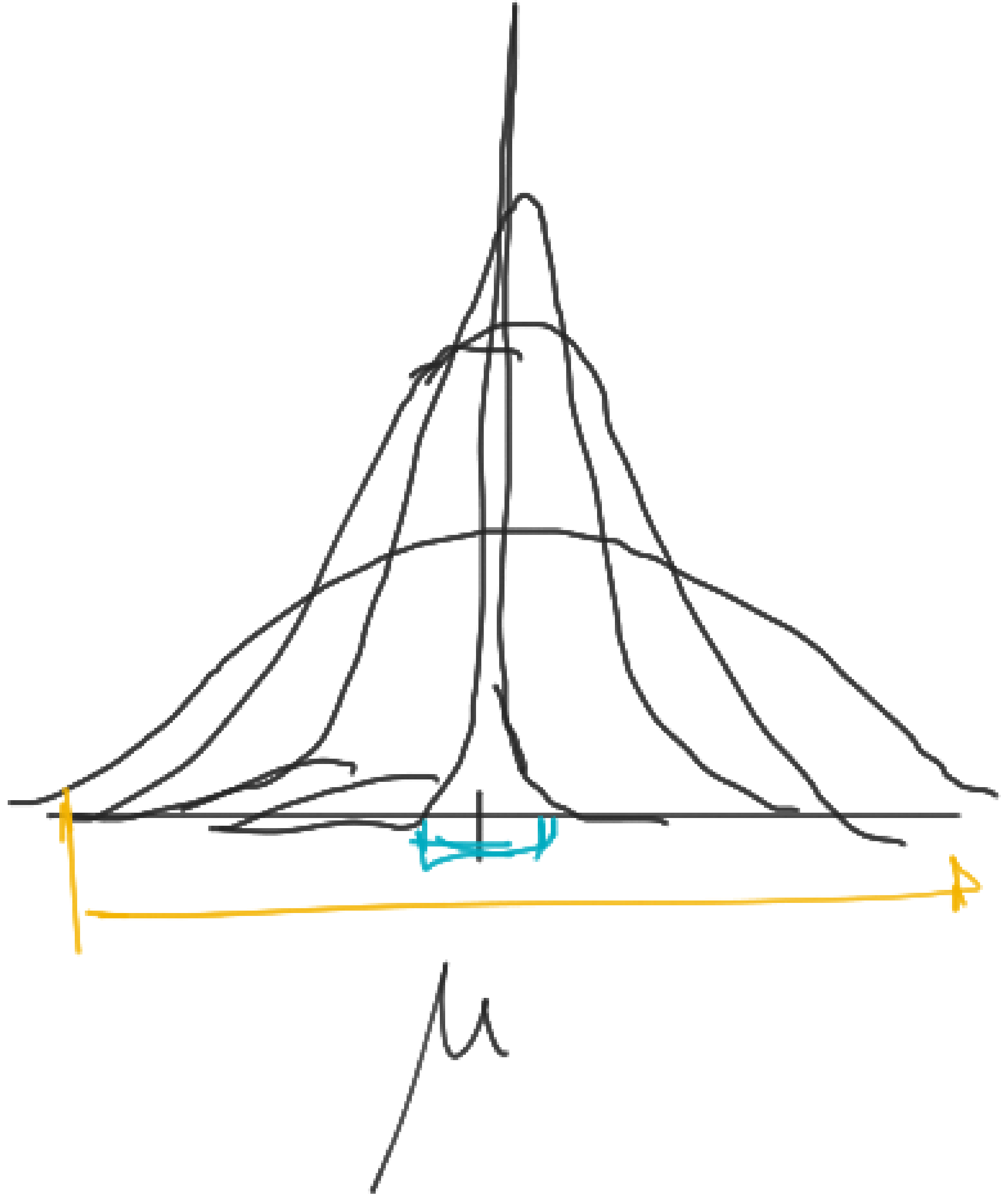
$$\mathbb{E}[\overline{X}] = \mathbb{E}\left[\frac{1}{n}\sum X_i\right] = \frac{1}{n}\sum_{i=1}^{n}\underbrace{\mathbb{E}[X_i]}_{\mu} = \frac{1}{n}\cdot n\mu = \mu$$

$$\text{Var}(\overline{X}) = \text{Var}\left(\frac{1}{n}\sum X_i\right) = \frac{1}{n^2}\text{Var}\left(\sum X_i\right) = \frac{1}{n^2}\sum \underbrace{\text{Var}(X_i)}_{4}$$

ind

$$\mathbb{E}\left[\left(\overline{X} - \mathbb{E}[\overline{X}]\right)^2\right]$$

$$\frac{1}{n^2} n \cdot 4 = 4/n$$



μ

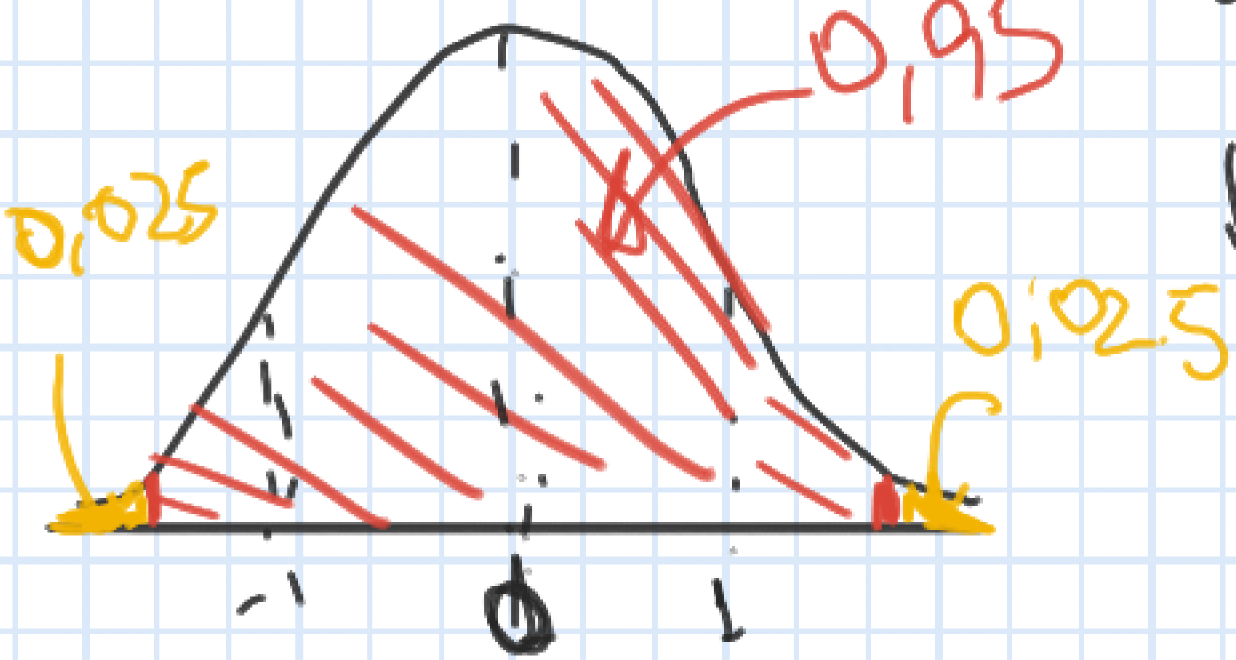
$\bar{X} \sim N(\mu, 4/n)$ $\quad U = \underbrace{\dfrac{\bar{X} - \mu}{\sqrt{4/n}}}_{\sqrt{n}\,\frac{(\bar{X}-\mu)}{2}} \sim N(0,1)$ (estandarización)

$\mathbb{P}(a < U < b) = 0.95$

$IC(\underline{X}) = \{\mu : -z_{0.975} < U(\underline{X}, \mu) < z_{0.975}\}$

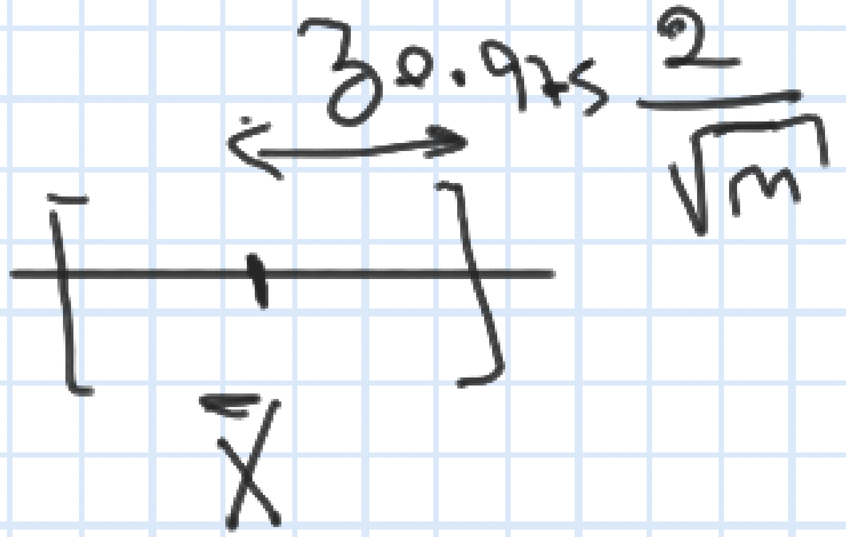
$a = z_{0.025} = -b$

$b = z_{0.975}$



$-z_{0.975} < \dfrac{\bar{X} - \mu}{2}\sqrt{n} < z_{0.975}$

$-z_{0.975}\dfrac{2}{\sqrt{n}} + \bar{X} < \mu < z_{0.975}\dfrac{2}{\sqrt{n}} + \bar{X}$



$$\mu \in \bar{x} \pm z_{0.975} \frac{2}{\sqrt{n}}$$

$Z \sim N(0,1)$ $\quad Z^2 \sim \chi^2_1$ $\quad \sum_{i=1}^{n} Z_i^2 \sim \chi^2_n$

$$\sum \frac{(X_i - \bar{X})^2}{\sigma^2} \sim \chi^2_{n-1}$$

$$\sum^{n} \Big(\underbrace{\frac{X_i - \mu}{\sigma}}_{\sim N(0,1)}\Big)^2 \sim \chi^2_n$$

$X \sim N(\mu, \sigma^2)$

$$\frac{\bar{X}-\mu}{\sigma}\sqrt{n} \sim N(0,1)$$

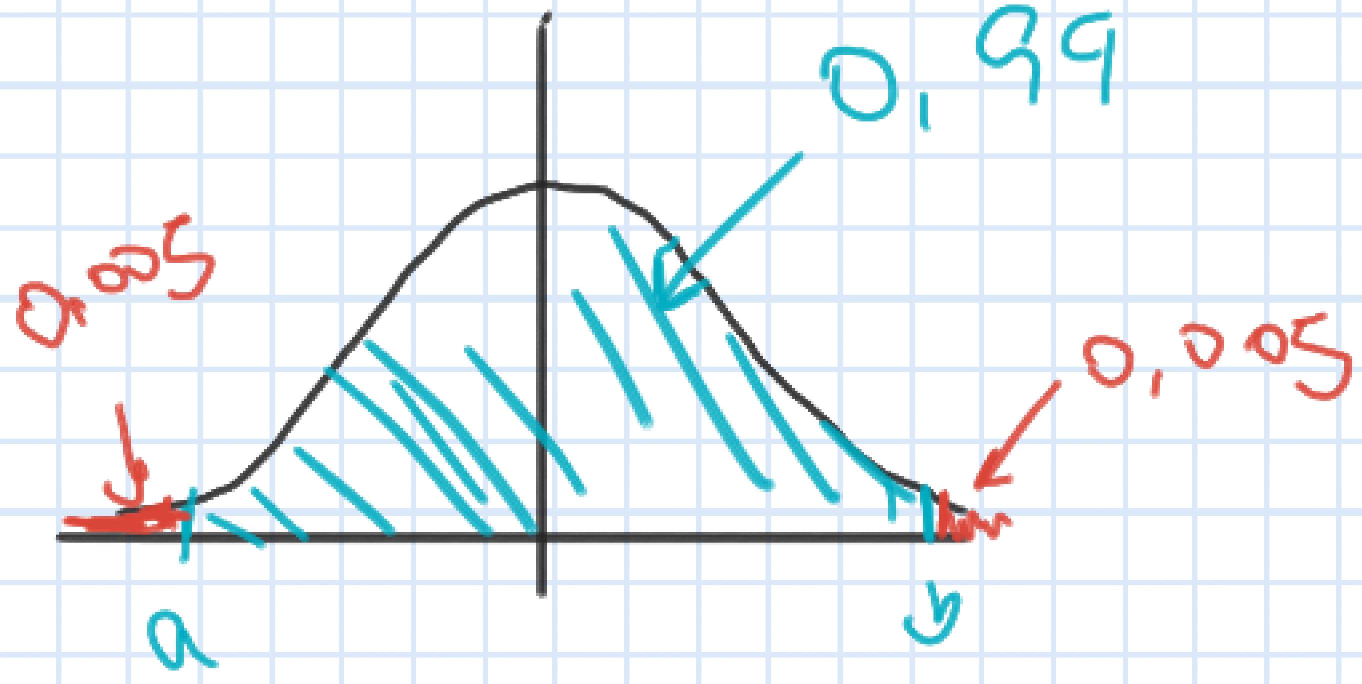
$$\frac{\bar{X}-\mu}{S}\sqrt{n} \sim t_{n-1}$$

$S^2 \rightarrow$ estimador de varianza

$\rightarrow S = \sqrt{S^2} \rightarrow$ estimador del desvío

Ej 5 | $\underline{X}$, $X_i \overset{iid}{\sim} N(\mu, \sigma^2)$

$$U = \frac{\bar{X} - \mu}{S}\sqrt{n} \sim t_{n-1}$$



$$a, b \;/\; P(a < U < b)$$

$$\mu: -t_{n-1,0.995} < \frac{\bar{X}-\mu}{S}\sqrt{n} < t_{n-1,0.995} \qquad b = t_{n-1,0.995}$$

$$a = t_{n-1,0.005} = -b$$

$$\mu: -t_{n-1,0.995}\frac{S}{\sqrt{n}} + \bar{X} < \mu < t_{n-1,0.995}\frac{S}{\sqrt{n}} + \bar{X}$$