

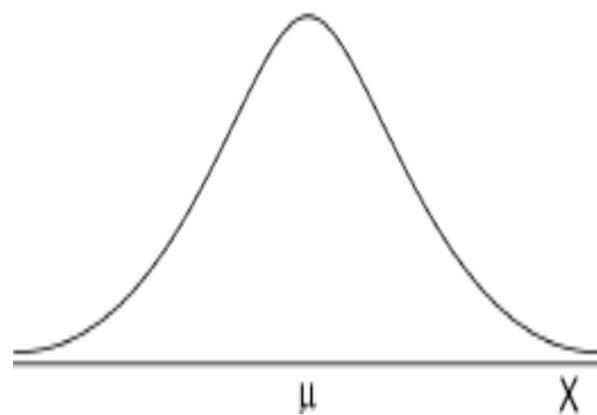
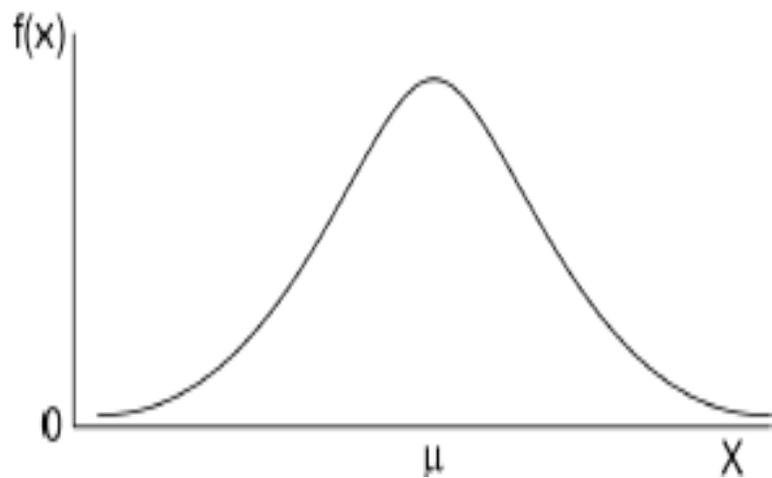
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Aula 5

Teórica

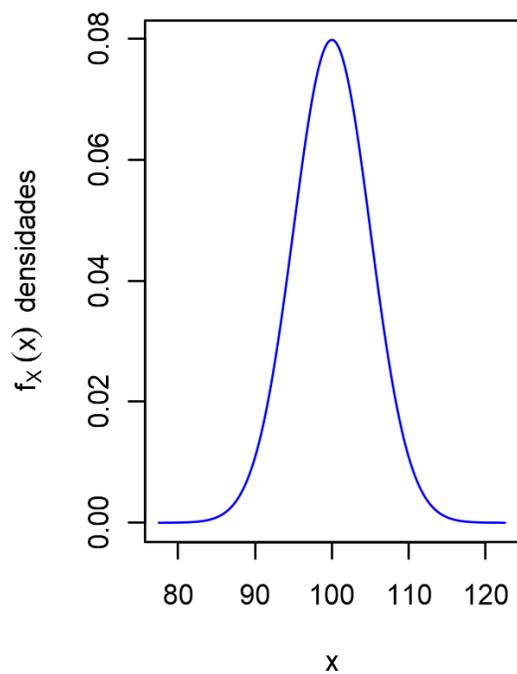
Normal Padrão

- Contínua

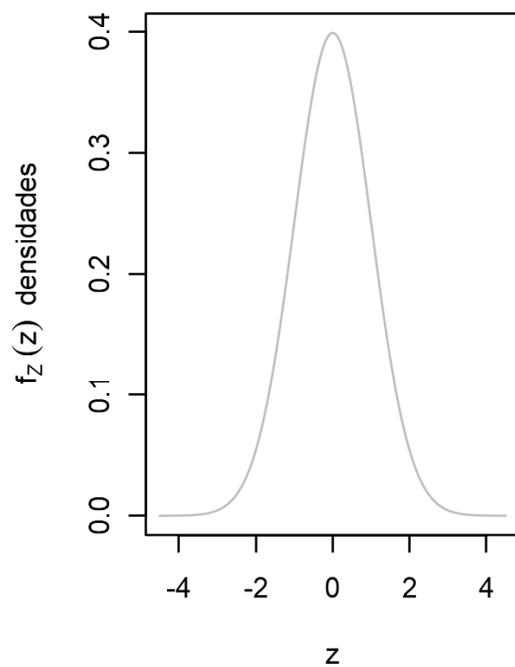


Normal Padrão

$$X \sim N(\mu = 100, \sigma^2 = 25)$$



$$Z \sim N(\mu = 0, \sigma^2 = 1)$$



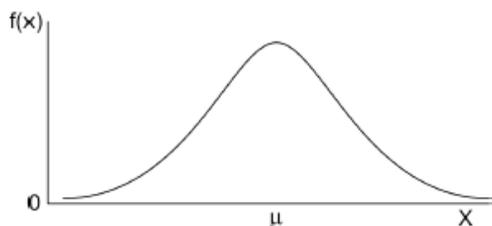
$$P[a \leq X \leq b] = P\left[\frac{a - \mu}{\sigma} \leq Z \leq \frac{b - \mu}{\sigma}\right], \text{ onde } X \sim \mathcal{N}(\mu, \sigma^2) \text{ e } Z \text{ é Normal Padrão}$$

Vale apresentar dois casos particulares da fórmula que são frequentemente usados:

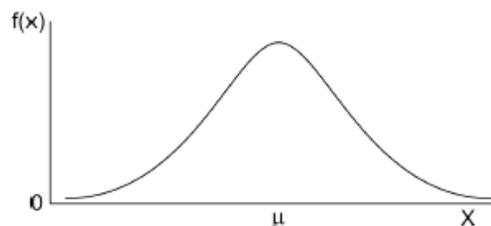
$$P[X \leq b] = P\left[Z \leq \frac{b - \mu}{\sigma}\right], \text{ e } P[X \geq a] = P\left[Z \geq \frac{a - \mu}{\sigma}\right]$$

Seja Z a variável aleatória normal padrão.
 Determine:

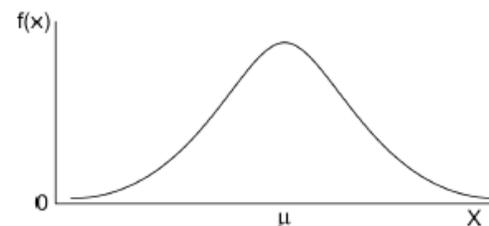
(a) $IP Z \leq 2, 13$;



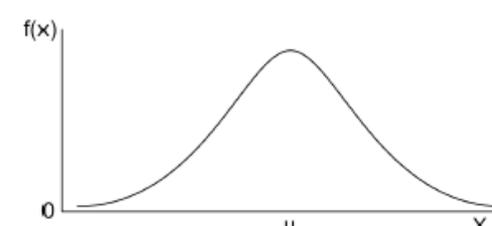
(b) $IP Z < 2, 13$;



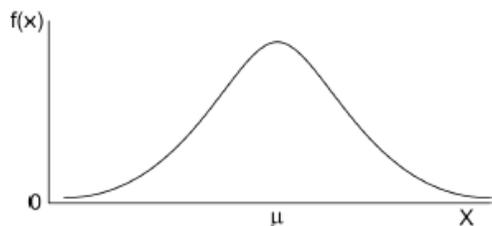
(c) $IP Z \geq 2, 13$;



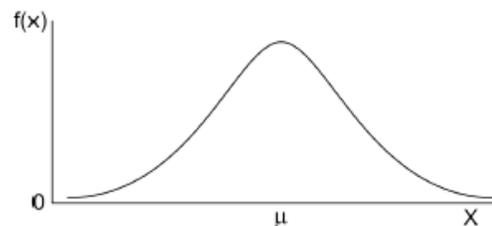
(d) $IP 0 \leq Z < 2, 13$;



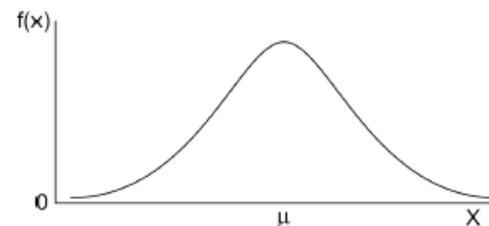
(h) $IP Z \leq -4, 5$.



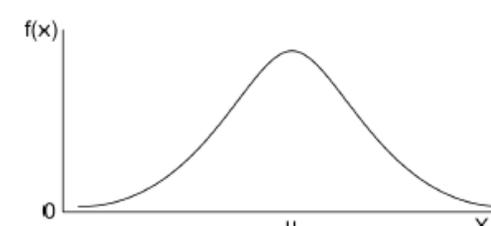
(f) $IP - 2, 13 \leq Z \leq 2, 13$;



(g) $IP Z \leq 5$;

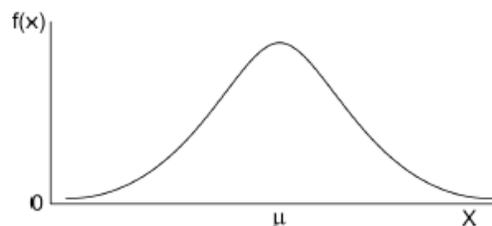


(e) $IP Z \leq -2, 13$;

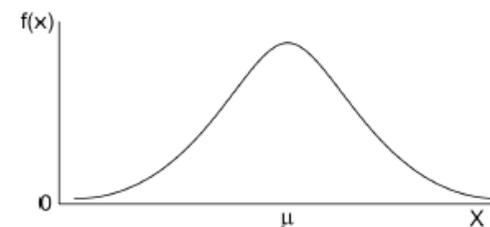


Seja Z a variável aleatória normal padrão.
Determine:

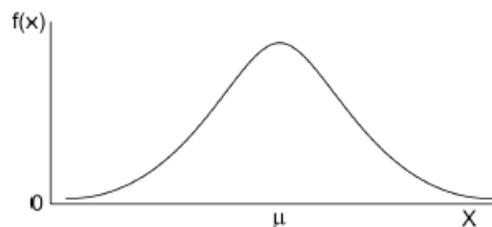
(a) o valor de z tal que $IP [Z \leq z] = 0,8907$;



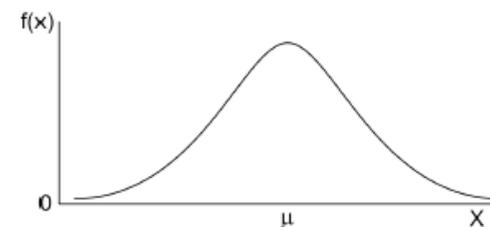
(b) o valor de z tal que $IP [Z < z] = 0,8907$;



(c) o valor de z tal que $IP [Z \geq z] = 0,1093$;

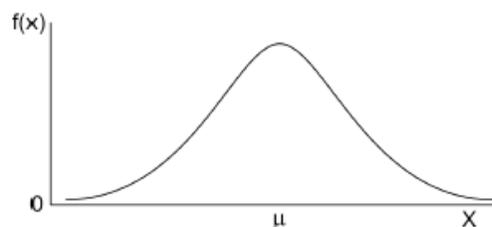


(d) aproximadamente, o valor de z tal que $IP [Z \leq z] = 0,9$

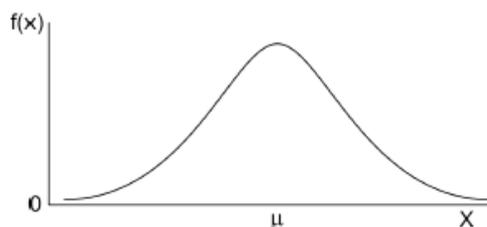


Seja X uma variável aleatória com distribuição normal de média 500 e desvio padrão 100.

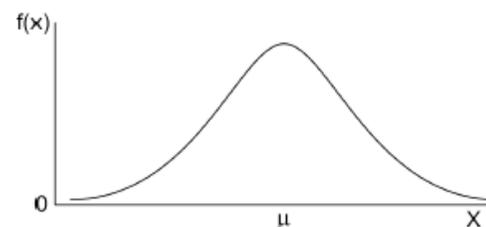
(a) Calcule $IP\ X \leq 450$.



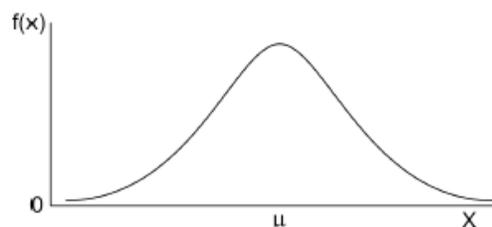
(b) Calcule $IP\ X \geq 650$.



(c) Calcule $IP\ 550 \leq X \leq 650$



(d) Dê os valores entre os quais estão compreendidos os 98% centrais da distribuição de X .



Lembre-se:

$$IP [a \leq X \leq b] = IP \left[\frac{a - \mu}{\sigma} \leq Z \leq \frac{b - \mu}{\sigma} \right]$$



A distribuição de notas de certo tipo de teste é normal com média 70 e desvio padrão 10 para os homens e média 75 e desvio padrão 8 para as mulheres.

(a) Qual é a porcentagem de homens com nota maior que 85?

(b) Qual é a porcentagem de mulheres com nota maior que 85?

(c) Se este teste for proposto numa sala na qual o número de homens é a metade do número de mulheres, qual é a porcentagem de pessoas que se espera obter nota maior que 85?

Lembre-se:

$$\mathbb{P}[a \leq X \leq b] = \mathbb{P}\left[\frac{a - \mu}{\sigma} \leq Z \leq \frac{b - \mu}{\sigma}\right]$$