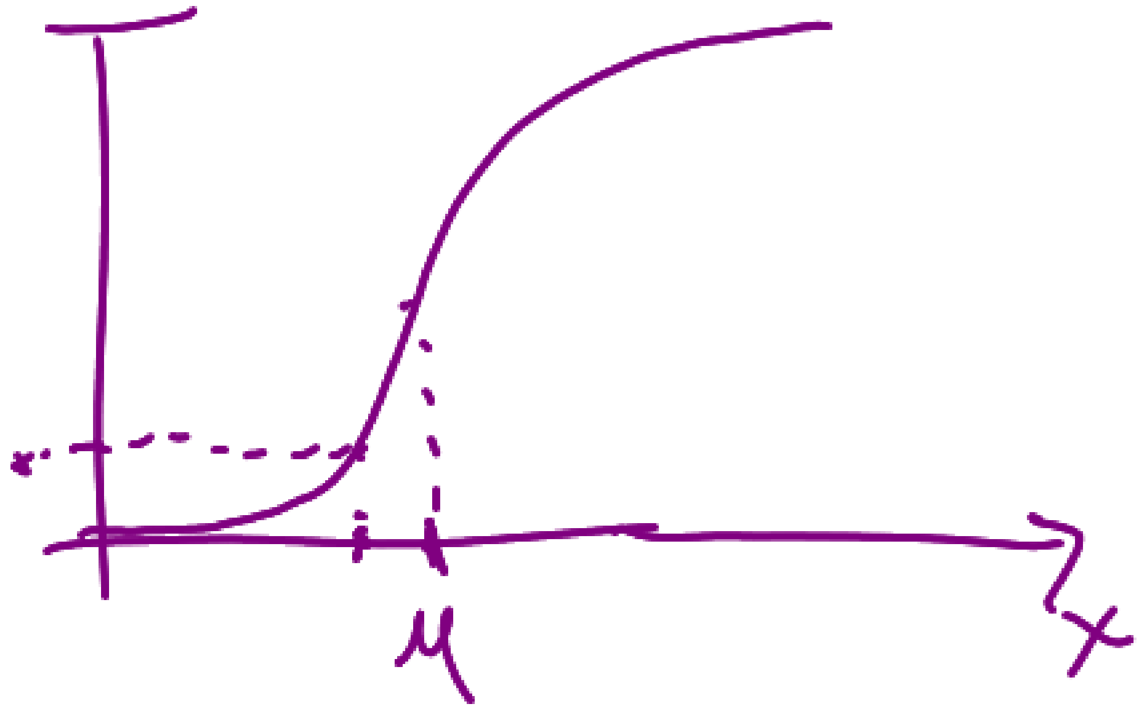
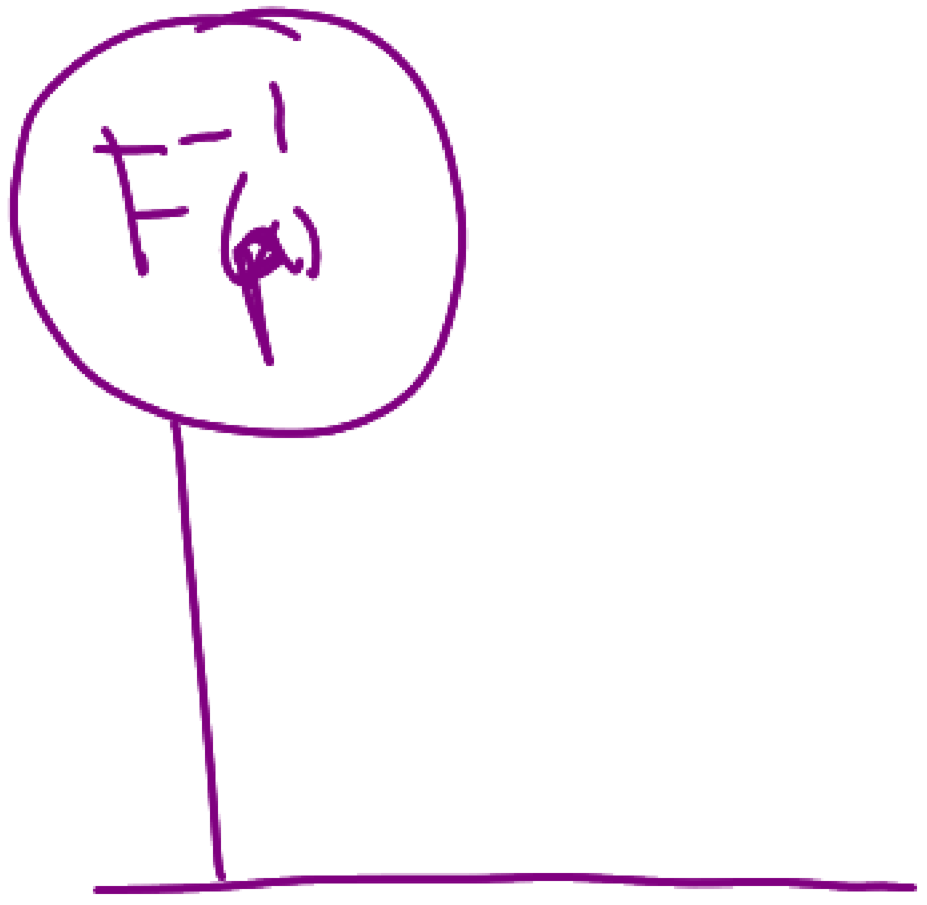
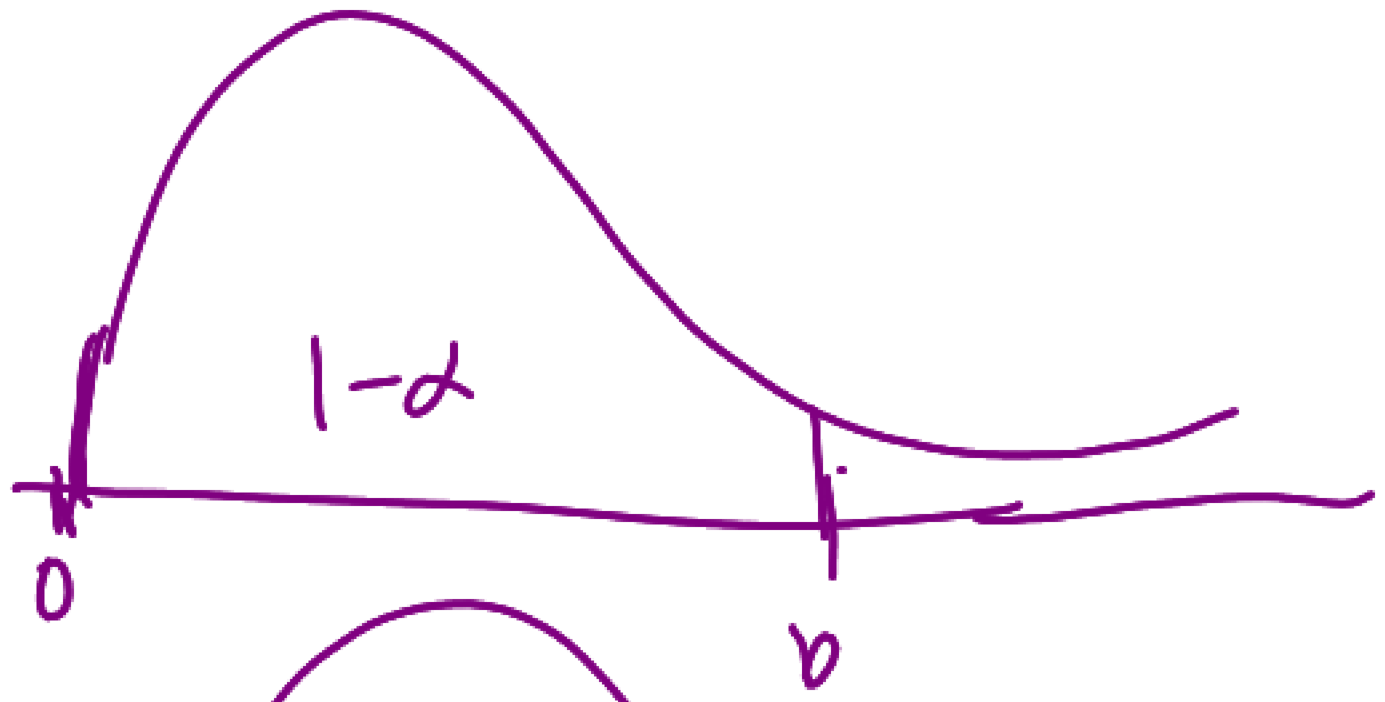
$X \sim N(\mu, \sigma^2)$

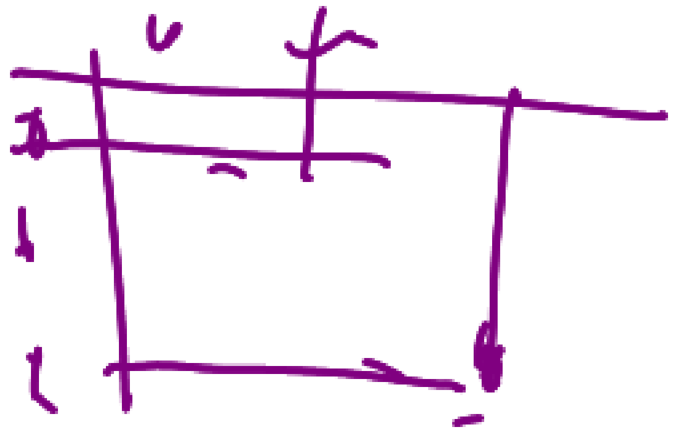
$P(a < X < b) = 1 - \alpha$

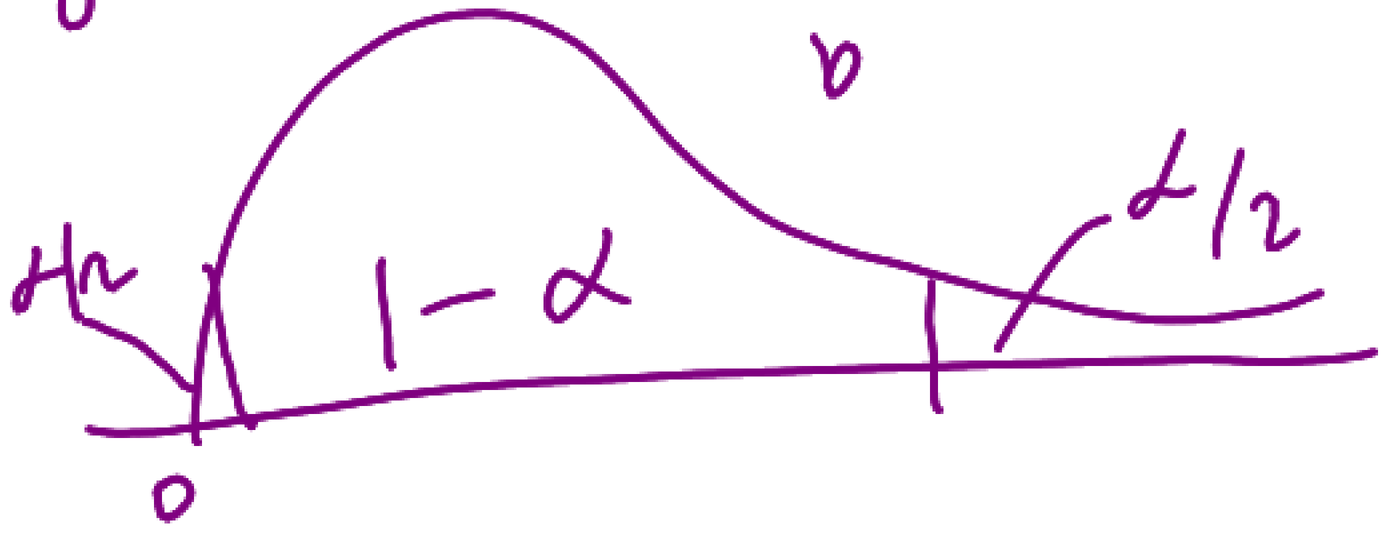
$F(x)$ —











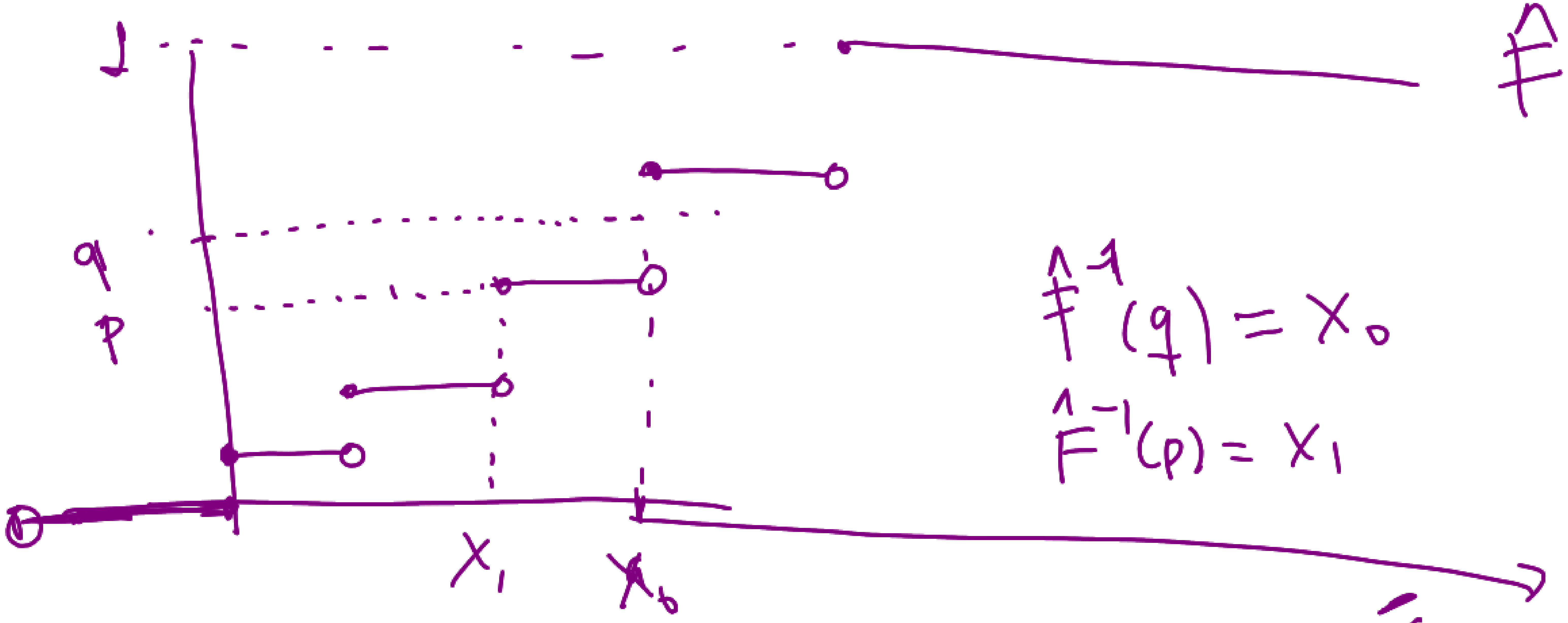
$P(a < X < b) = 1 - \alpha$

$P\left(\frac{a-\mu}{\sigma} < Z < \frac{b-\mu}{\sigma}\right) = 1 - \alpha$

$\frac{a-\mu}{\sigma} = Z_{\alpha/2}$

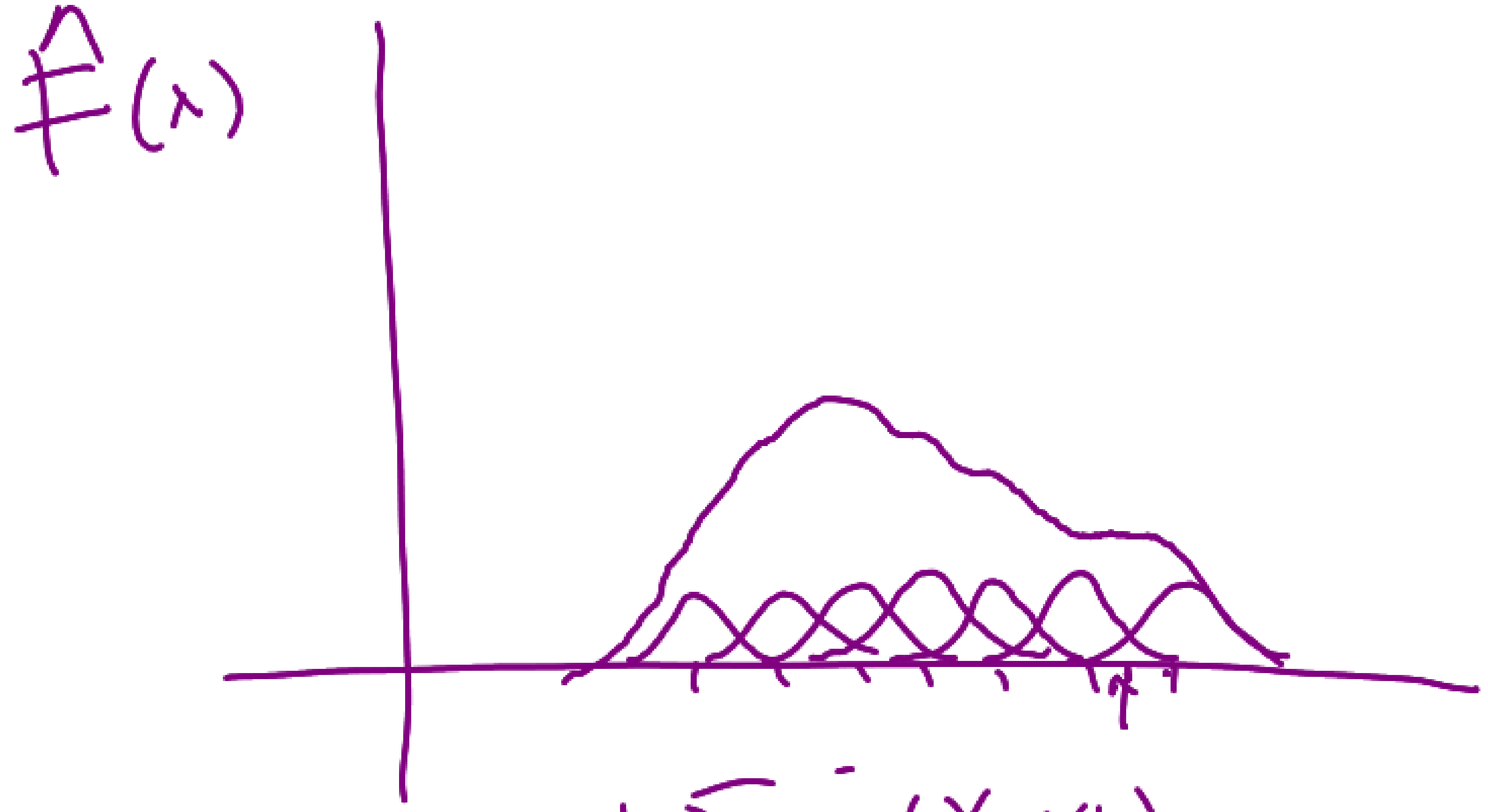
$a = \mu + Z_{\alpha/2}\sigma$

$b = \mu + Z_{\alpha/2}\sigma$



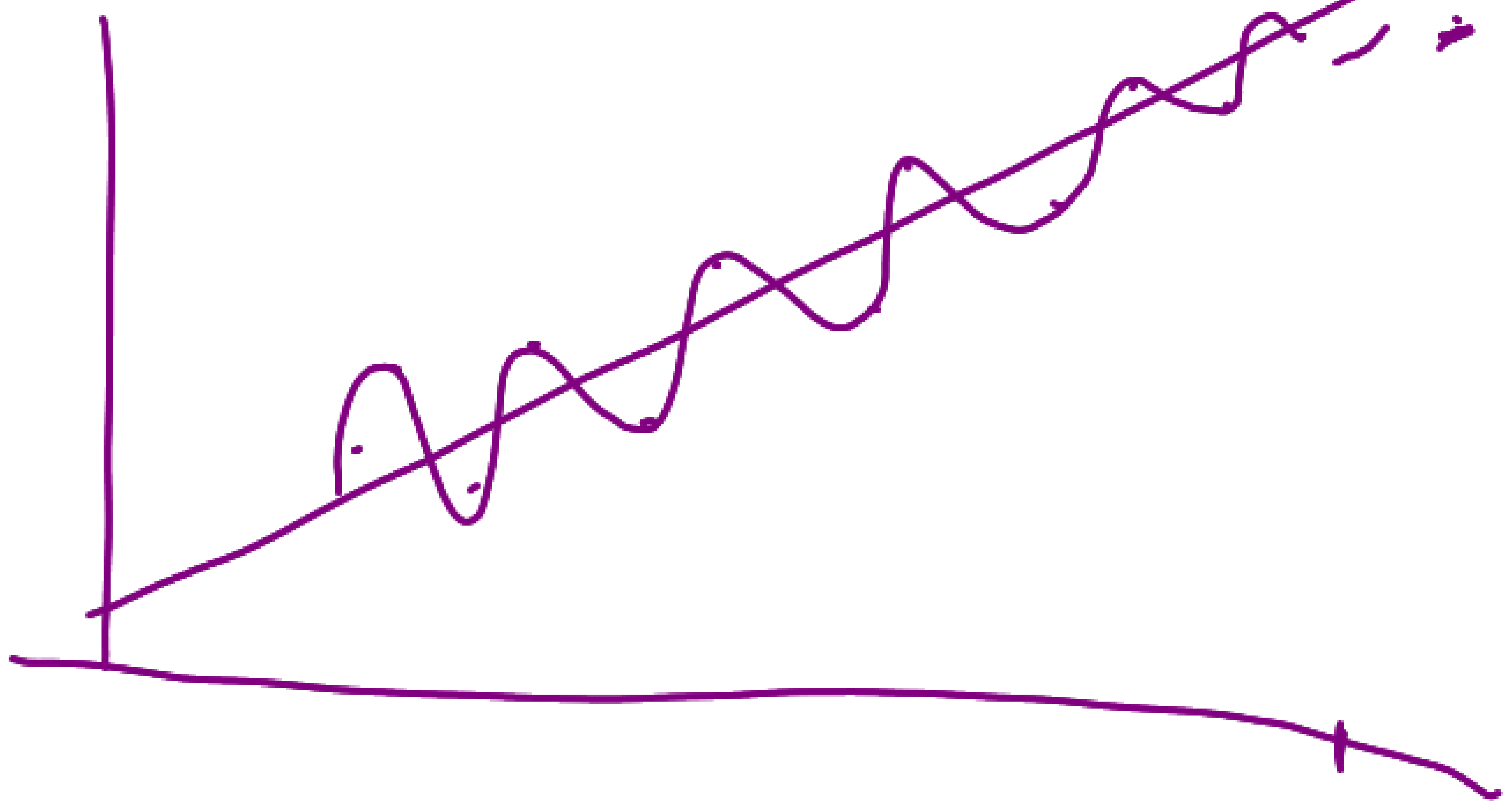
$$\hat{F}^{-1}(q) = X_0$$

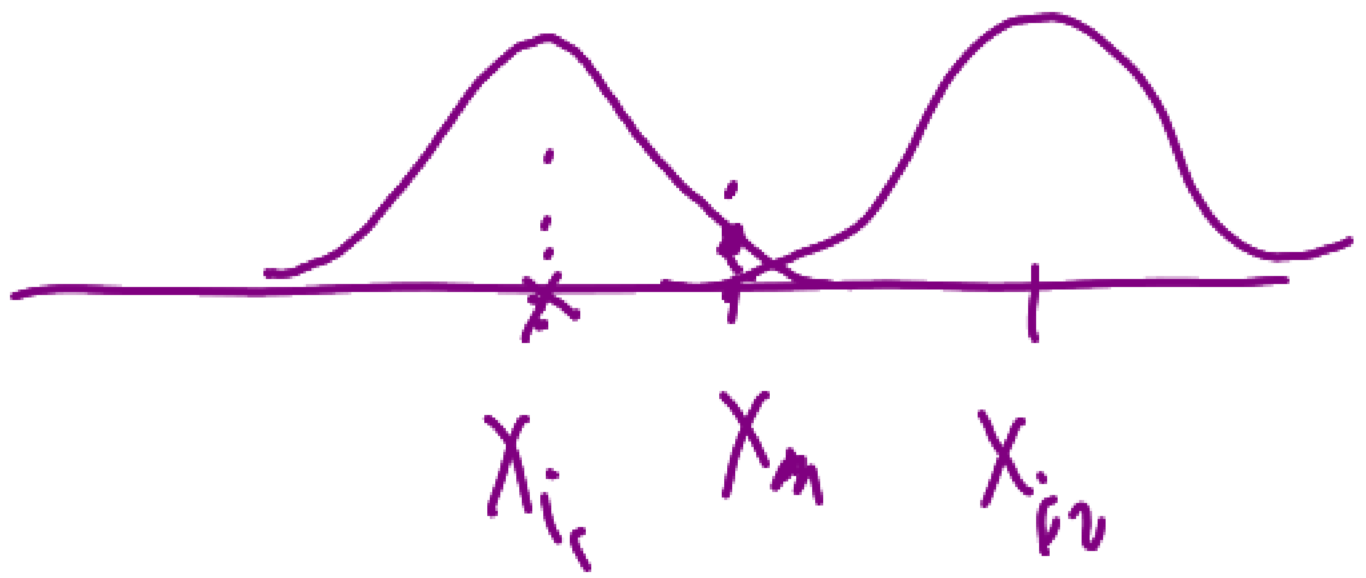
$$\hat{F}^{-1}(p) = X_1$$



$$h(x) = \frac{1}{nh} \sum K\left(\frac{x - x_i}{h}\right)$$

$$F^{-1}(p) = X_1$$





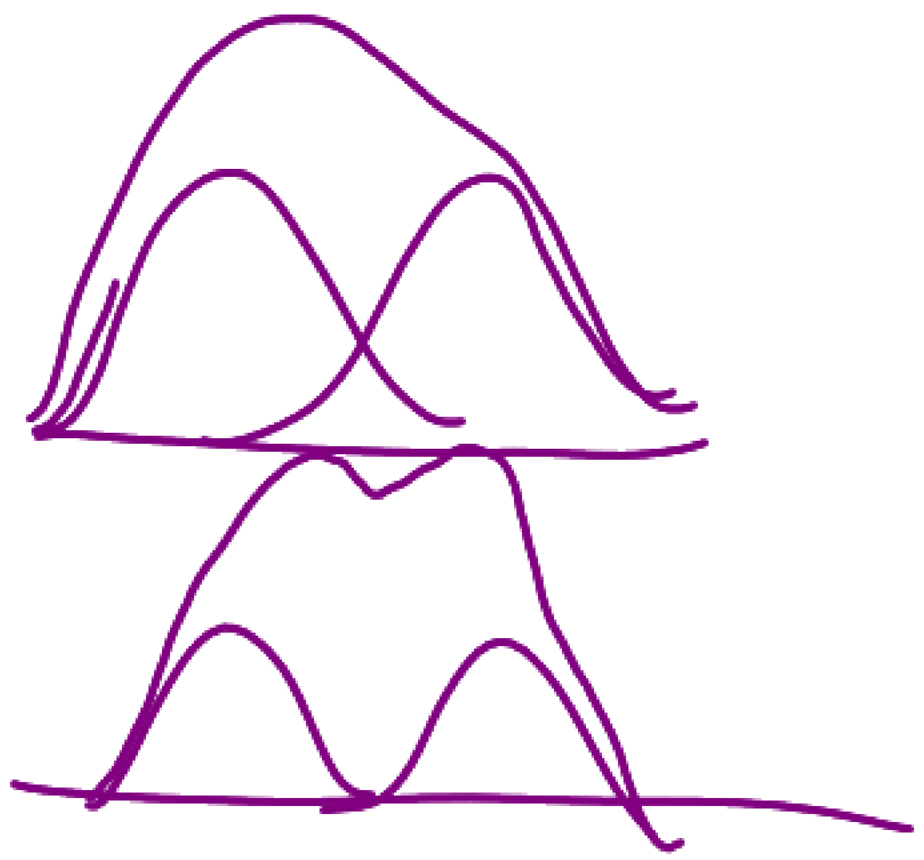
$$\hat{f}(x) = \frac{1}{nh} \sum K\left(\frac{x_i - x}{h}\right)$$

$$K\left(\frac{x_i - x}{h}\right) = \frac{1}{\sqrt{2\pi}\,h} e^{-\frac{(x_i - x)^2}{2h}}$$

$$K(x) = \frac{1}{\sqrt{2\pi}} e^{-x_i^2/2}$$

$$\hat{f}(x) \geq 0$$

$$\boxed{\int_{-\infty}^{\infty} f(x)\,dx = 1}$$



$X \sim f(x)$ $\quad Y \sim g(x)$

$$af(x) + (1-a)\,g(x)$$

$$a \in (0,1)$$