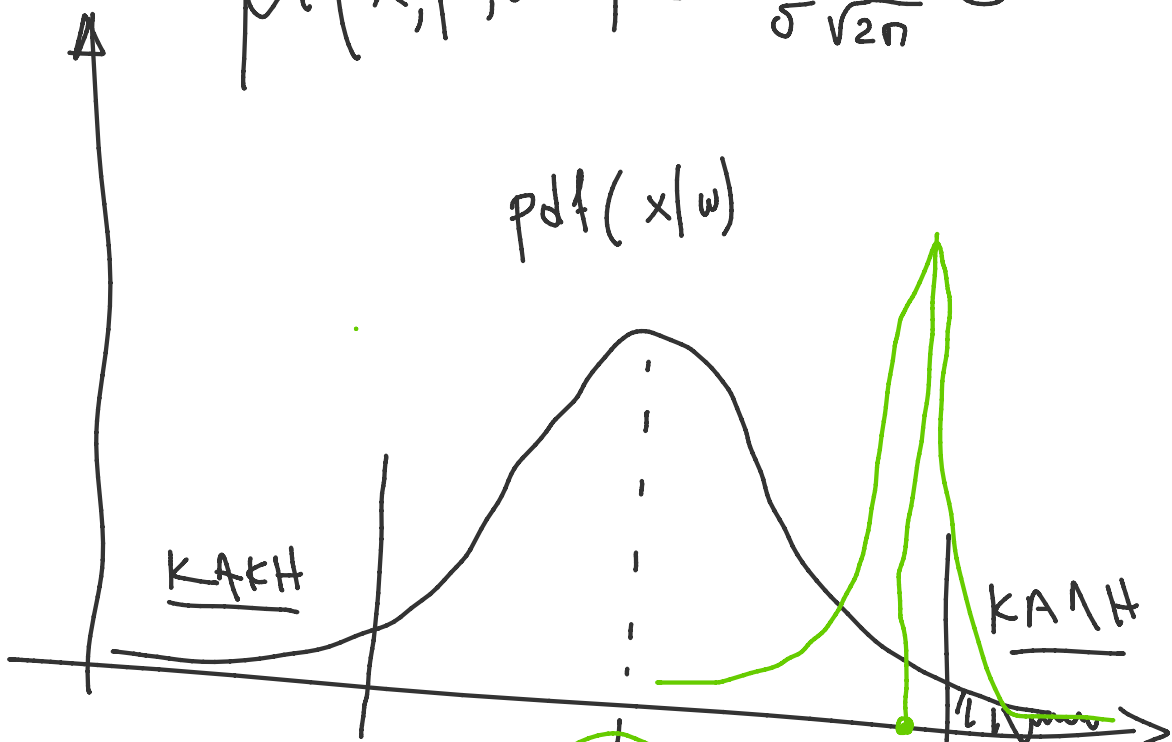
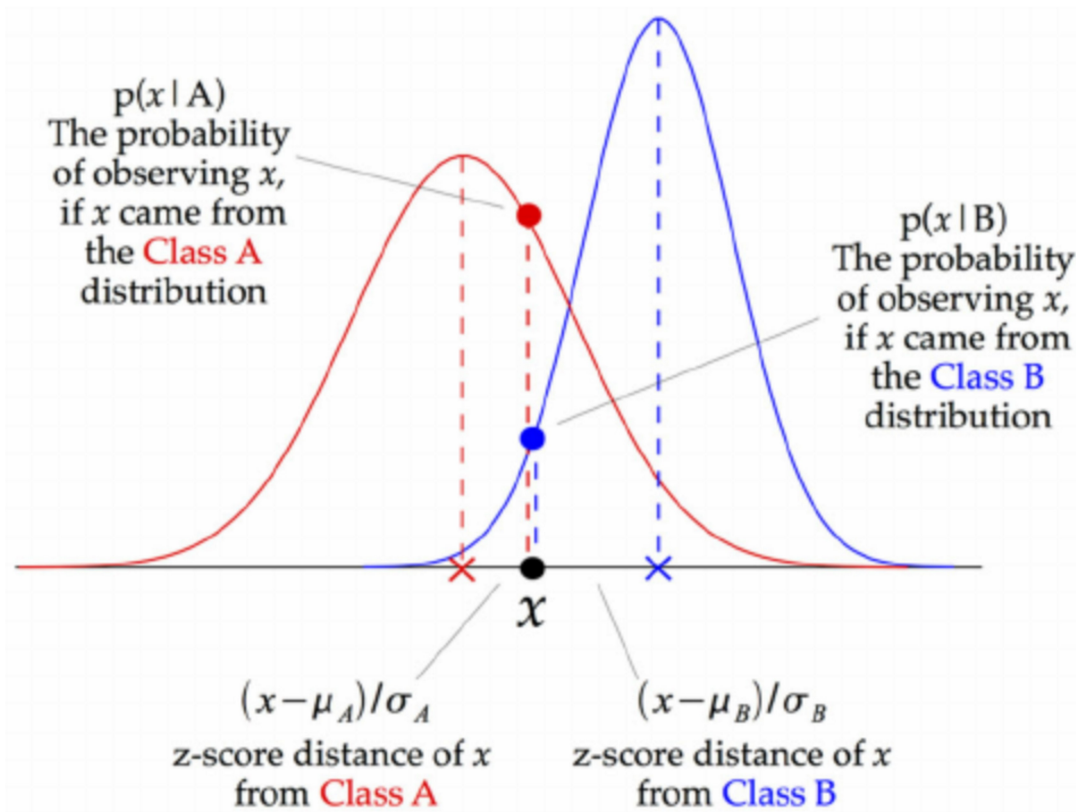
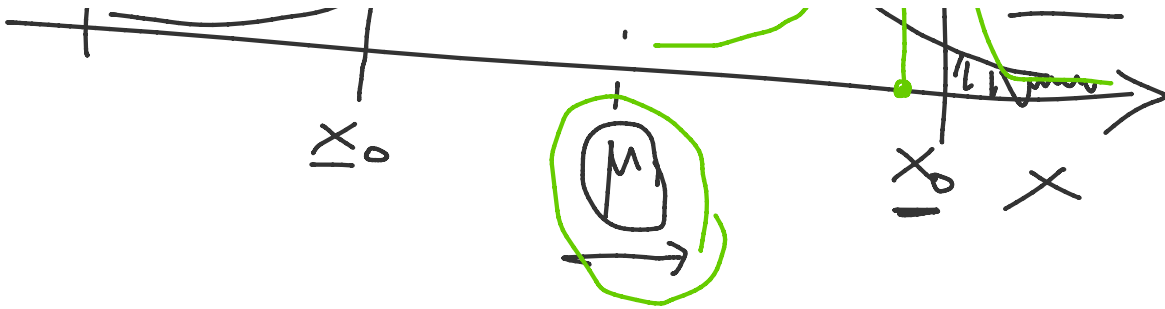
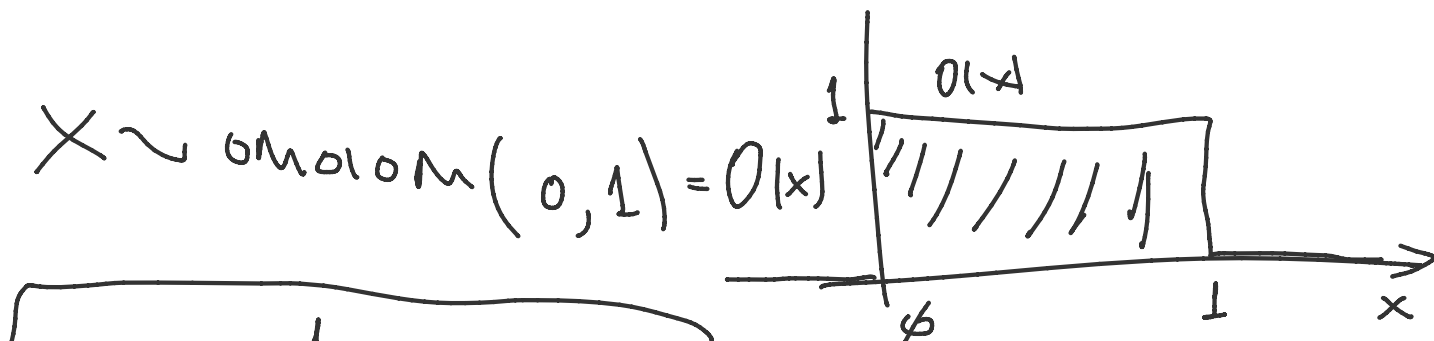


$$f(x, \mu, \sigma^2) = \frac{1}{\sigma \sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$





$$X \sim f_x(x) \rightarrow Y = g(X) \sim f_y(y)$$



$$D_{X|Y} = \begin{cases} 1, & \phi \leq x \leq 1 \\ \phi, & \text{otherwise} \end{cases}$$



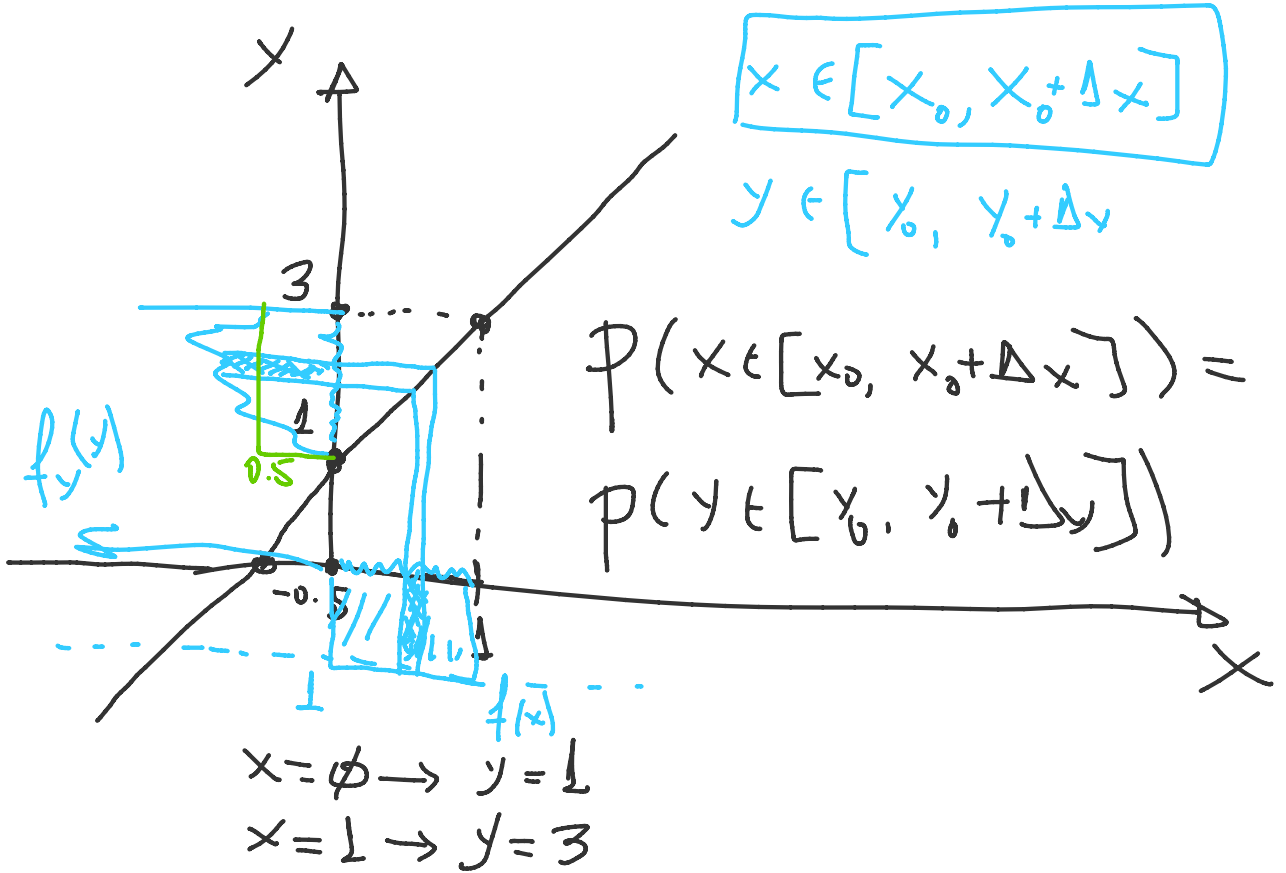
$$x \rightarrow \boxed{\alpha x + \beta} \rightarrow y$$

$$\boxed{y = \alpha x + \beta}$$

$$y = 2x + 1$$

$$\boxed{x = \frac{y - b}{a}}$$

$\Rightarrow f_Y(y)$

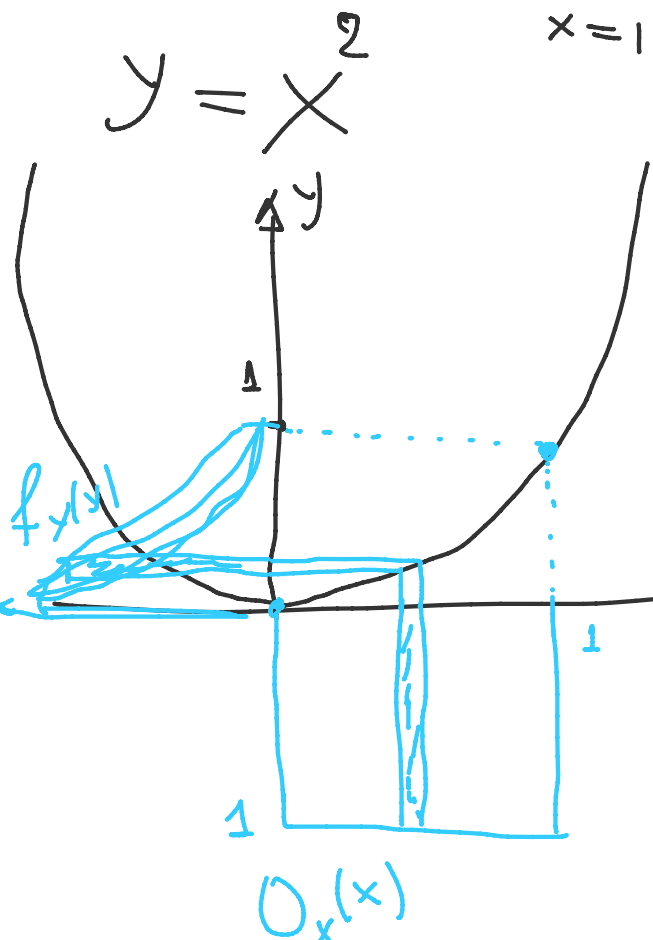


$$\boxed{f'_x(x) | dx = f'_y(y) | dy} \Rightarrow \underbrace{f'_y(y)} = \underbrace{f'_x(x)} \left| \frac{dx}{dy} \right|$$

$$f_y(y) = O_x(x) \left| \frac{1}{\alpha} \right| \Rightarrow f_y(y) = \begin{cases} \frac{1}{2}, & 1 \leq y \leq 3 \\ \emptyset, & \text{otherwise} \end{cases}$$

$$x = \emptyset \rightarrow y = \emptyset$$

$$x = 1 \rightarrow y = 1$$



$$f_y(y) = \begin{cases} \frac{1}{2\sqrt{y}}, & 0 \leq y \leq 1 \\ \emptyset, & \text{otherwise} \end{cases}$$

$$\int_{\emptyset}^1 f_y(y) dy = 1 = \int_{\emptyset}^1 \frac{1}{2\sqrt{y}} dy$$

$$y = x^2 \Rightarrow x = \sqrt{y}$$

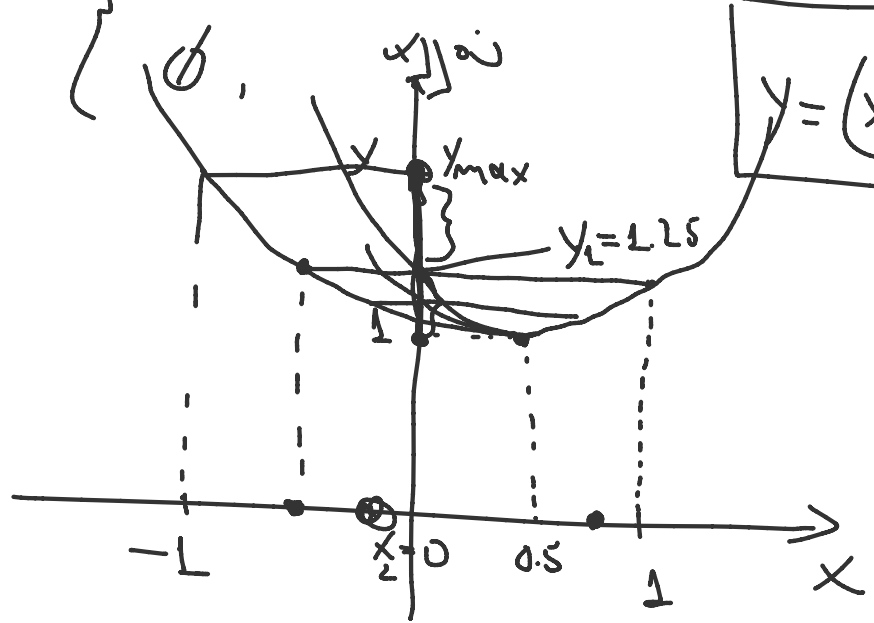
$$\frac{\partial x}{\partial y} = \frac{\partial}{\partial y} (y^{1/2}) = +\frac{1}{2} y^{-1/2} = \frac{1}{2\sqrt{y}}$$

$$f_y(y) = f_x(x) \left| \frac{\partial x}{\partial y} \right| = \frac{1}{2\sqrt{y}}$$

$$0 \leq y \leq 1$$

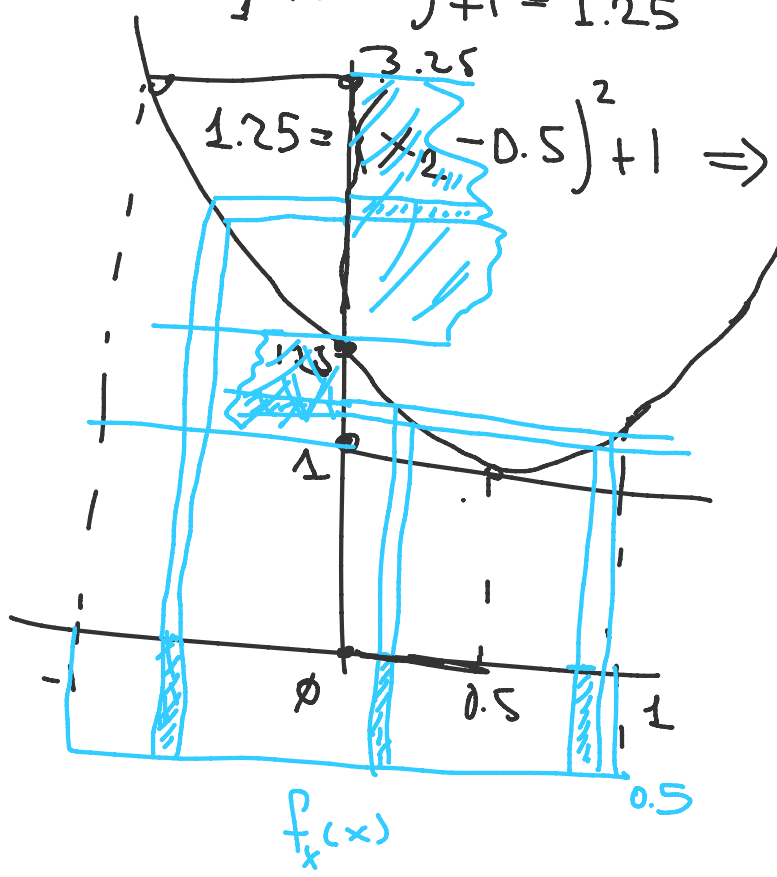
$$f_{1,1} - \left(\frac{1}{2} \quad -1 \leq x \leq 1 \right)$$

$$f_x(x) = \begin{cases} \frac{1}{2} & -1 \leq x \leq 1 \\ \emptyset & \text{otherwise} \end{cases}$$



$$y = (x - 0.5)^2 + 1$$

$$y_1 = (1 - 0.5)^2 + 1 = 1.25$$



$$1.25 = (x_2 - 0.5)^2 + 1 \Rightarrow (x_2 - 0.5)^2 = 0.25 \Rightarrow x_2 = 0$$

$$y_{max} = (-1.5)^2 + 1 = 3.25$$

$$f_y(y) = \begin{cases} \frac{1}{4\sqrt{y-1}} & 1.25 \leq y \leq 3.25 \\ \emptyset & \text{otherwise} \end{cases}$$

$$f_y(y) |dy| = f_x(x) |dx| + f_x(x) |dx|$$

$$f_{y|y} = f_x(x) \left| \frac{\partial x}{\partial y} \right| = \frac{f_x(x) |0 \cdot x| + f_x(x) |0 \cdot x|}{x + (0.5) \quad x + (0.5, 1)}$$

$$\boxed{y = (x - 0.5)^2 + 1} \Rightarrow y - 1 = (x - 0.5)^2 \Rightarrow$$

$$\underbrace{|x - 0.5|}_{(-1, 0)} = \underbrace{\sqrt{y - 1}} \Rightarrow 0.5 - x = \sqrt{y - 1} \Rightarrow$$

$$x = 0.5 - \sqrt{y - 1} \Rightarrow \frac{\partial x}{\partial y} = -\frac{1}{2\sqrt{y - 1}} \Rightarrow \left| \frac{\partial x}{\partial y} \right| = \frac{1}{2\sqrt{y - 1}}$$

$$f_y(y) = \frac{1}{4} \frac{1}{\sqrt{y - 1}}$$

$$f_x(x) \xrightarrow{y = g(x)} f_y(y)$$

$$\left. \begin{array}{l} x \sim f_x(x) \\ y \sim f_y(y) \end{array} \right\} \begin{array}{l} \rightarrow H(f_x) \\ z = x + y \rightarrow f_z(z) \\ \rightarrow H(f_y) \end{array}$$

$$f_z(z) = f_x(x) \otimes f_y(y)$$

$$= \int_{z \in \mathcal{Z}} f_x(x) f_y(x-z) dx$$

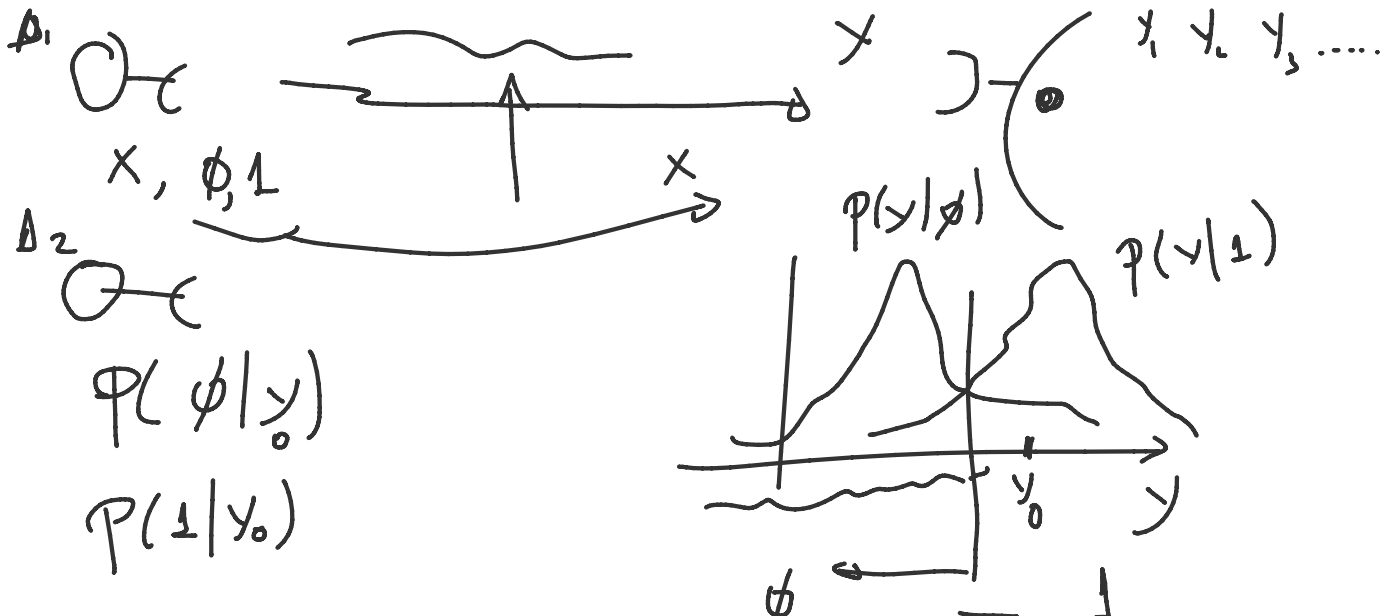
$$x + y + z$$

$$y = \frac{\sum z}{N}$$

$$\frac{(x_1 + x_2 + x_3 + \dots + x_N)}{N} = y$$

$$f_y(y) = ?$$

$$y = A + x, \quad x \sim N$$



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$\phi \leftarrow \frac{1}{y \ll T} \downarrow$