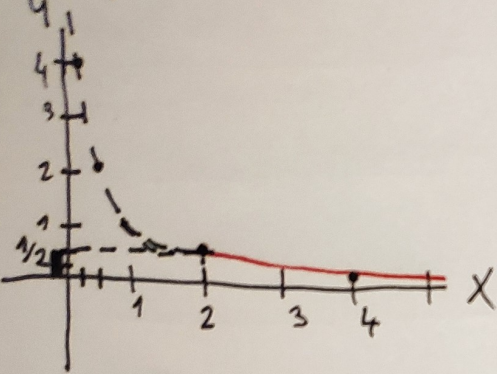


$$y = \frac{1}{x}$$



$$f_x(x) = \begin{cases} \frac{24}{x^4} & x \geq 2 \\ 0 & \text{jinak} \end{cases}$$

Náhodná vel.  $X$  je int.  $(2; \infty)$  spojitá

transf. fa.  $h(x) = \frac{1}{x}$  je int.  $(\frac{1}{2}; \infty)$  rýze monotonní

$$\Rightarrow f_y(y) = f_x(h^{-1}(y)) \cdot \left| \frac{dh^{-1}(y)}{dy} \right|$$

$$h^{-1}(y): x = \frac{1}{y}$$

$$(h^{-1}(y))' = -\frac{1}{y^2}$$

$$\Rightarrow f_y(y) = \frac{24}{(\frac{1}{y})^4} \cdot \frac{1}{y^2} = \frac{24y^4}{y^2} = \underline{\underline{24y^2}} \quad y \in (0; \frac{1}{2})$$

$$f_y(y) = \begin{cases} 24y^2 & y \in (0; \frac{1}{2}) \\ 0 & \text{jinak} \end{cases}$$

$$F_y(y) = \int_0^y 24t^2 dt = 24 \left[ \frac{t^3}{3} \right]_0^y = 8y^3 \quad y \in (0; \frac{1}{2}) \Rightarrow F_y(y) = \begin{cases} 0 & y \in (-\infty; 0) \\ 8y^3 & y \in (0; \frac{1}{2}) \\ 1 & y \in (\frac{1}{2}; \infty) \end{cases}$$

Druhá metoda:

$$F_x(x) = \begin{cases} 0 & x \in (-\infty; 2) \\ -\frac{8}{x^3} + 1 & x \in [2; \infty) \end{cases}$$

$$\int_2^x \frac{24}{t^4} dt = 24 \int_2^x t^{-4} dt = 24 \left[ -\frac{1}{3t^3} \right]_2^x = 24 \left( -\frac{1}{3x^3} + \frac{1}{24} \right) = -\frac{8}{x^3} + 1$$

$$F_y(y) = P(Y \leq y) = P\left(\frac{1}{X} \leq y\right) = P\left(1 \leq X_y\right) = P\left(X \geq \frac{1}{y}\right) = 1 - F_x\left(\frac{1}{y}\right) = 1 - \left(-\frac{8}{(\frac{1}{y})^3} + 1\right) = 1 + 8y^3 - 1 = \underline{\underline{8y^3}}$$

vyšlo stejné  $\Leftrightarrow$  hurá.