

2. spôsob:

$$\lim_{y \rightarrow \infty} F(x, y) = \lim_{y \rightarrow \infty} \frac{1}{y} x^2 y^2 = \underline{\underline{x^2}}$$

$$\lim_{x \rightarrow 1} F(x, y) = \lim_{x \rightarrow 1} \frac{1}{y} x^2 y^2 = \underline{\underline{\frac{1}{y} y^2}}$$

Cvičení 9.

1. Určete hustotu prst. náh. vektoru $(X, Y) \sim F(x, y)$

$$F(x, y) = \begin{cases} 0 & x \leq -1 \\ \frac{1}{\pi^2} (\arcsin x + \frac{1}{2}) (\arctan y + \frac{\pi}{2}) & |x| \leq 1 \\ \frac{1}{\pi} (\arctan y + \frac{\pi}{2}) & x \geq 1 \end{cases}$$

Určete marginální + či jsou X a Y nezávislé?

$$f(x, y) = \frac{\partial}{\partial x \partial y} F(x, y)$$

$$\left(\frac{\partial}{\partial x} \right)'_y = 0 \quad \text{pro } x \leq -1$$

$$\left(\left(\frac{1}{\pi} \arctan y + \frac{\pi}{2} \right)'_y \right)'_x = 0 \quad \text{pro } x \geq 1$$

$$\begin{aligned} \text{pro } |x| \leq 1 : \quad & \frac{\partial}{\partial x} \left(\frac{\partial}{\partial y} \left(\frac{1}{\pi^2} (\arcsin x + \frac{1}{2}) (\arctan y + \frac{\pi}{2}) \right) \right) = \\ & = \frac{\partial}{\partial x} \left(\frac{1}{\pi^2} \left(\frac{1}{\sqrt{1-x^2}} + \frac{1}{2} \cdot \frac{1}{1+y^2} \right) \right) = \frac{1}{\pi^2} \cdot \frac{1}{\sqrt{1-x^2} \cdot (1+y^2)} \quad \text{pro } |x| \leq 1 \end{aligned}$$