Marginální hustoty

$$f_1(x) = \int_{-\infty}^{\infty} \frac{1}{\pi^2} \frac{1}{\sqrt{1-x^2}} \frac{1}{(1+y^2)}\, dy = \frac{1}{\pi^2} \cdot \frac{1}{\sqrt{1-x^2}} \left[\text{arctg}(\infty) - \text{arctg}(-\infty) \right] =$$

$$= \frac{1}{\pi^2} \cdot \frac{1}{\sqrt{1-x^2}} \cdot \left(\frac{\pi}{2} - \left(-\frac{\pi}{2}\right) \right) = \underline{\underline{\frac{1}{\pi} \frac{1}{\sqrt{1-x^2}}}}$$

$$f_2(y) = \frac{1}{\pi^2} \int_{-\infty}^{\infty} \frac{1}{\sqrt{1-x^2}} \frac{1}{(1+y^2)}\, dx = \frac{1}{\pi^2} \int_{-1}^{1} \frac{1}{\sqrt{1-x^2}} \frac{1}{(1+y^2)}\, dx =$$

$$= \frac{1}{(1+y^2)} \frac{1}{\pi^2} \cdot \left[\arcsin \right]_{-1}^{1} = \frac{1}{1+y^2} \cdot \frac{1}{\pi} \cdot \left[\frac{\pi}{2} - \left(-\frac{\pi}{2}\right) \right] = \underline{\underline{\frac{1}{1+y^2} \cdot \frac{1}{\pi}}}$$

X a Y nezávislé? Musíme overiť či

$$f(x,y) = f(x) \cdot f(y) \quad \underline{\underline{\text{alebo}}} \quad F(x,y) = F_x(x) \cdot F_y(y)$$

$$f(x,y) = \frac{1}{\pi^2} \cdot \frac{1}{(1+y^2)} \cdot \frac{1}{\sqrt{1-x^2}}$$

✓

$$f_1(x) \cdot f_2(y) = \frac{1}{\pi} \cdot \frac{1}{\pi} \cdot \frac{1}{\sqrt{1-x^2}} \cdot \frac{1}{(1+y^2)} = \frac{1}{\pi^2} \frac{1}{\sqrt{1-x^2}} \frac{1}{(1+y^2)}$$

<u>Sú nezávislé.</u>