

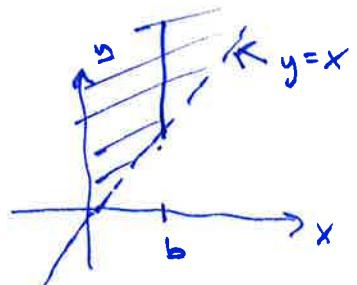
$$\underline{6.2.1} \quad p(x,y) = \frac{1}{n^2} = n^{-2}, \quad 1 \leq x, y \leq n$$

$$\begin{aligned} p(x>y) &= p(2,1) + p(3,1) + \dots + p(n,1) \\ &\quad + \quad \quad p(3,2) + \dots + p(n,2) \\ &\quad + \quad \quad \quad p(4,3) + \dots + p(n,3) \\ &\quad + \dots + \quad p(n,n-1) \\ &= \frac{1}{n^2} \cdot \left\{ (n-1) + (n-2) + \dots + 1 \right\} \\ &= \frac{1}{n^2} \cdot \left(\frac{1+(n-1)}{2} \cdot (n-1) \right) = \frac{1}{n^2} \cdot \frac{n(n-1)}{2} = \underline{\underline{\frac{1}{2} \frac{n-1}{n}}} \end{aligned}$$

$$\begin{aligned} p(x=y) &= p(1,1) + p(2,2) + \dots + p(n,n) \\ &= n \cdot \frac{1}{n^2} = \underline{\underline{\frac{1}{n}}} \end{aligned}$$

$$\underline{6.3.1} \quad f(x,y) = e^{-y}, \quad 0 \leq x < y < \infty$$

$$F_X(b) = \iint_{0 \times}^{b \times} f(x,y) dy dx$$

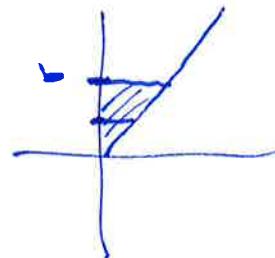


$$= \int_0^b \left[-e^{-y} \right]_x^\infty dx = \int_0^b e^{-x} dx$$

$$= \left[-e^{-x} \right]_0^b = -e^{-b} + e^0 = \underline{\underline{1 - e^{-b}}}, \quad b \geq 0$$

$$f_x(x) = (1 - e^{-x})'_x = \underline{\underline{e^{-x}}}, \quad x \geq 0$$

$$F_y(b) = \int_0^b \int_0^y f(x,y) dx dy$$



BI

$$= \int_0^b [xe^{-y}]_{x=0}^{x=y} dy$$

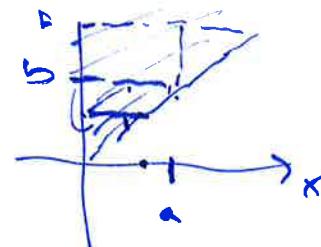
$$= \int_0^b ye^{-y} dy = \left[-ye^{-y} + \int e^{-y} dy \right]_0^b$$

$$= \left[-ye^{-y} - e^{-y} \right]_0^b = -be^{-b} - e^{-b} + e^0 = \frac{1 - be^{-b} - e^{-b}}{1}$$

$$F_y(y) = \underline{\underline{1 - ye^{-y} - e^{-y}}}, y \geq 0 \quad (b \geq 0)$$

$$f_y(y) = -1 \cdot e^{-y} - y \cdot e^{-y}(-1) - e^{-y} \cdot (-1) = \underline{\underline{ye^{-y}}}, y \geq 0$$

$$F_{xy}(a,b) = \int_0^a \int_x^b f(x,y) dy dx$$



$$= \int_0^a \left(-e^{-y} \right)_x^b dx = \int_0^a e^{-x} - e^{-b} dx$$

$$= \left[-e^{-x} - xe^{-b} \right]_0^a = -e^{-a} - ae^{-b} + e^0$$

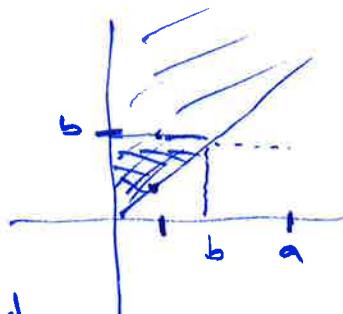
$$= \underline{\underline{1 - e^{-a} - ae^{-b}}}, a, b \geq 0 \text{ und } a \leq b$$

$$f_{xy}(x,y) = \underline{\underline{1 - e^{-x} - xe^{-y}}}, x, y \geq 0 \text{ und } x \leq y$$

Für $b < a$: $F_{xy}(a,b) = \int_0^b \int_x^a f(x,y) dy dx$

$$= 1 - e^{-b} - be^{-b}$$

$$\Rightarrow F_{xy}(x,y) = \underline{\underline{1 - e^{-y} - ye^{-x}}}, x, y \geq 0 \text{ und } x \geq y$$



6.3.3.

$$F(x,y) = 1 - e^{-xy}, \quad 0 \leq x, y < \infty$$

BI

$$F'_x = -e^{-xy} \cdot (-y) = y e^{-xy}$$

$$F''_{xy} = 1 \cdot e^{-xy} + y \cdot e^{-xy} \cdot (-x) = \\ (1 - xy) e^{-xy}$$

||

$$f(x,y) = \underline{(1 - xy)} e^{-xy}, \quad 0 \leq x, y < \infty$$

For $x=y=2$, or $f(2,2) = (1-4)e^{-4} = -3e^{-4} < 0$

$f(x,y) \geq 0 \quad \text{for alle } x, y$

ikke tilfredsstilt
||

ikke
sannsynlighetsf.d.