

Opgave 1

Let (X, Y) have joint cdf F . Show that

$$P(a < X \leq b, c < Y \leq d) = F(b, d) + F(a, c) - F(a, d) - F(b, c) \quad (1)$$

Tegn et rektangel med ovenstående punkter som hjørner. Så er det let at se, hvilke arealer der skal summeres og trækkes fra.

Opgave 2

Let (X, Y) have joint cdf F and let $x \leq y$. For which set do we get the probability if we compute $F(y, y) - F(x, x)$?

Tegn rektanglet og se, at

$$\{X \leq x \leq Y \leq y\} \quad (2)$$

Opgave 6

Find the marginal cdf's of X and Y for the following joint cdfs:

(a) $F(x, y) = 1 - e^{-x} - e^{-y} + e^{-(x+y)}, x, y \geq 0$

(b) $F(x, y) = x^2 \sqrt{y}, 0 \leq x \leq 1, 0 \leq y \leq 1$

(c) $F(x, y) = 2xy, 0 \leq x \leq \frac{1}{2}, 0 \leq y \leq 1$

(a) $F(x, y) = \frac{1}{3}(x^2y + 2xy^2), 0 \leq x \leq 1, 0 \leq y \leq 1$