ISyE 2027, Homework 6
Due July 1, Friday

1. Suppose $P(X = x, Y = y) = c(x + y)$ for $x, y = 0, 1, 2, 3$.
(a) Compute c.
(b) Compute $P(X > Y)$.

2. Let X and Y have a joint density $f(x, y) = c(x + y)$ for $0 < x < 1$ and $0 < y < 1$.
(a) Compute c.
(b) Compute $P(X < 1/2)$.
(c) Compute the joint cumulative distribution function.

3. Suppose X and Y have joint density $f(x, y)$. Are X and Y independent if
(a) $f(x, y) = xe^{-x(1+y)}$ for $x > 0$ and $y > 0$?
(b) $f(x, y) = 2xy + x$ for $0 < x < 1$ and $0 < y < 1$?
(c) $f(x, y) = (x + y)^2 - (x - y)^2$ for $0 < x < 1$ and $0 < y < 1$?
In each case $f(x, y) = 0$ otherwise.