MTH 451 Quiz 6

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Question 1.

(a) We can simply use the table and find the value for $X = 1$ and $Y = 2$ which is $1/23$

(b) We fix $Y = 0$ and sum from $x = 1$ to $x = 2$. So $f(1,0) + f(2,0) = 4/23 + 2/23 = 6/23$

(c) The only three points satisfying this are $\{(0,0),(1,0),(0,1)\}$ adding together the probability of each one gives $8/23$.

(d) For this condidtion the only points in the domain satisfying this are $\{(1,0),(2,0),(2,1),(3,0)\}$. Summing them gives $11/23$.

(e) $F(1.5, 0.9) = P(X \leq 1.5, Y \leq 0.9) = 4/23 + 1/23 = 5/23$

(f) Note that the CDF is defined for all $(x,y) \in \mathbb{R}^2$ so it's fine that 5 is not in the support. $F(2.7, 5) = 21/23$. We simply add all probabilitys with $x < 3$.

Question 2.

We have $F_X(x) = \sum_y f(x,y)$

(a) we fix $x \in \{0,1,2,3\}$ and sum over Y to get, $F_X(0) = 6/23$, $F_X(1) = 10/23$, $F_X(2) = 5/23$, $F_X(3) = 2/23$.

(b) Now we fix $y \in \{0,1,2\}$ and sum over X to get, $F_Y(0) = 10/23$, $F_Y(1) = 10/23$, $F_Y(2) = 3/23$,