

CS 333202: Probability and Statistics
HW11 Part II

1. (a) i. $p(0, 0) = \frac{14}{39}$
 $p(0, 1) = p(1, 0) = \frac{10}{39}$
 $p(1, 1) = \frac{5}{39}$
ii. $p(0, 0, 0) = \frac{28}{143}$
 $p(0, 0, 1) = p(0, 1, 0) = p(1, 0, 0) = \frac{70}{429}$
 $p(0, 1, 1) = p(1, 0, 1) = p(1, 1, 0) = \frac{40}{429}$
 $p(1, 1, 1) = \frac{5}{143}$
- (b) i. $P(X_1 = 1|X_2 = 1) = \frac{4}{12}, P(X_1 = 0|X_2 = 1) = \frac{8}{12}$
ii. $P(X_1 = 1|X_2 = 0) = \frac{5}{12}, P(X_1 = 0|X_2 = 0) = \frac{7}{12}$
2. $P(X > 1|Y = y) = e^{-1/y}$
3. $f_X(x) = \begin{cases} -\ln(1-x) & 0 < x < 1 \\ 0 & \text{elsewhere.} \end{cases}$