

Q2

$$\begin{aligned} a) \quad & \bar{F}_{x,y}(0.5, -1) \\ & \bar{F}_{x,y}(0.5, -1) = \begin{cases} \frac{1}{8} & \text{for } x = -1 \text{ \& } y = -2 \\ 0 & \text{for } x = -1 \text{ \& } y = -1 \\ 0 & \text{for } x = 0.5 \text{ \& } y = -2 \\ \frac{1}{4} & \text{for } x = 0.5 \text{ \& } y = -1 \end{cases} \\ & = \frac{1}{8} + \frac{1}{4} \\ & = \frac{3}{8} \end{aligned}$$

$$\begin{aligned} b) \quad & P_X(-1) = \frac{1}{8} + 0 + 0 \\ & = \frac{1}{8} \end{aligned}$$

$$\begin{aligned} P_X(0.5) &= \frac{1}{4} + \frac{1}{2} \\ &= \frac{3}{4} \end{aligned}$$

$$\begin{aligned} P_X(1) &= \frac{1}{8} + 0 + 0 \\ &= \frac{1}{8} \end{aligned}$$

$$\begin{aligned} c) \quad & P_{Y/X}(-2/0.5) = \frac{P_{X,Y}(0.5, -2)}{P_X(0.5)} \\ & = 0 \cdot \frac{4}{3} \\ & = 0 \end{aligned}$$

$$\begin{aligned} P_{Y/X}(-1/0.5) &= \frac{P_{X,Y}(0.5, -1)}{P_X(0.5)} \\ &= \frac{1}{4} \cdot \frac{4}{3} \\ &= \frac{1}{3} \end{aligned}$$

$$\begin{aligned} P_{Y/X}(1/0.5) &= \frac{P_{X,Y}(0.5, 1)}{P_X(0.5)} \\ &= \frac{1}{2} \cdot \frac{4}{3} \\ &= \frac{2}{3} \end{aligned}$$