

5)  $f_{xy}(x,y) = \begin{cases} 3(y-x+1), & 0 \leq y \leq x < 1 \\ 0, & \text{otherwise} \end{cases}$

$$\begin{aligned} f_x(x) &= \int_{-\infty}^{\infty} f_{xy}(x,y) dy = \int_0^x 3(y-x+1) dy \\ &= 3 \left( \frac{y^2}{2} + (1-x)y \right) \Big|_0^x \\ &= \frac{3x^2}{2} + 3x - 3x^2 \end{aligned}$$

$$\boxed{f_x(x) = 3x - \frac{3x^2}{2}}$$

$$\begin{aligned} f_y(y) &= \int_{-\infty}^{\infty} f_{xy}(x,y) dx = \int_0^1 3(y-x+1) dx \\ &= 3 \left( xy - \frac{x^2}{2} + x \right) \Big|_0^1 = 3 \left( y - \frac{1}{2} + 1 \right) \end{aligned}$$

$$\boxed{f_y(y) = 3y + \frac{3}{2}}$$