Note 1:

$$\hat{p}_N(x) = \frac{1}{Nh}\sum_{i=1}^{N} K\left(\frac{x_i - x}{h}\right)$$

$$\hat{p}_N(x,y) = \frac{1}{Nh^2}\sum_{i=1}^{N} K\left(\frac{x_i - x}{h}\right) K\left(\frac{y_i - y}{h}\right)$$

$$\int y\, \hat{p}_N(x,y)\,dy = \frac{1}{Nh^2}\sum_{i=1}^{N} K\left(\frac{x_i - x}{h}\right) \int y\, K\left(\frac{y_i - y}{h}\right) dy$$

$$\frac{1}{h}\int y\, K\left(\frac{y_i - y}{h}\right) dy = \int \frac{y - y_i}{h} K\left(\frac{y_i - y}{h}\right) dy + \frac{y_i}{h}\int K\left(\frac{y_i - y}{h}\right) dy$$

$$= -h\int u\,K(u)\,du + y_i \int K(u)\,du$$

Considering a kernel such that

$$\int K(u)\,du = 1, \quad \int u\,K(u)\,du = 0$$

we have

$$\frac{1}{h}\int y\, K\left(\frac{y_i - y}{h}\right) dy = y_i,$$

Therefore

$$\hat{f}(x) = \frac{1}{Nh\,\hat{p}(x)}\sum_{i=1}^{N} y_i\, K\left(\frac{x_i - x}{h}\right) = \frac{\sum_{i=1}^{N} y_i\, K\left(\frac{x_i - x}{h}\right)}{\sum_{i=1}^{N} K\left(\frac{x_i - x}{h}\right)}$$