8 f] with the given $f(x,y)$,

the marginal distribution of x (analogously y) is

$$f(x) = k\,\phi(x) + k|x| \int_{|y|<1} \phi(y)|y| \qquad |x|<1$$

$$= k\,\phi(x) \qquad |x|>1$$

The conditional distribution given $y=0$

is

$$f(x) = \frac{k\,\phi(x)\,\phi(0)}{k\,\phi(0)} = \phi(x) \qquad -\infty < x < \infty$$

When $y = \pm 1$,

$$f(x) = \frac{k\,\phi(x)\,\phi(\pm 1)}{k\,\phi(\pm 1)} = \phi(x) \qquad -\infty < x < \infty$$

When $y = 0.5$ (analogously -0.5)

$$f(x) = \frac{k(\phi(x)\,\phi(0.5) + 0.5|x|)}{k\,\phi(0.5) + k\,0.5 \int_{|x|<1} \phi(x)|x|} \qquad |x|<1$$

$$= \frac{K\,\phi(x)\,\phi(0.5)}{K\,\phi(0.5) + 0.5\,K \int_{|x|<1} \phi(x)\,|x|} \qquad |x|>1$$

when K is s.t

$$K \int_x \int_y \phi(x)\,\phi(y)\,\{1 + |x|\,|y|\, 1\{\max\{|x|,|y|\}<1\}\}\,dx\,dy = 1$$