

(13)

$$\int_I \bar{f}_n d(x,y) - \int_I \underline{f}_n d(x,y)$$

$$= \frac{1}{n^5} \left( n^3 + \sum_{k=1}^{n-1} kn^2 + \sum_{l=1}^{n-1} nl^2 \right)$$

$$= \frac{1}{n^2} + \frac{1}{n^3} \frac{(n-1)n}{2} + \frac{1}{n^4} \frac{(n-1)n(n+1)}{6}$$

$\rightarrow 0$  für  $n \rightarrow \infty$

$$\int_I \underline{f}_n d(x,y) \leq \int_I f d(x,y) \leq \int_I \bar{f}_n d(x,y)$$

existiert