

For #5 on P.487, you may use the general area formula:

$$\int_K |\det Du| dx = \int_{\mathbf{R}^n} \#(K \cap u^{-1}\{y\}) dy$$

where $\#(A) =$ “the number of points in A ”. This formula implies that, for K bounded, $\#(K \cap u^{-1}\{y\}) < \infty$ for almost all $y \in \mathbf{R}^n$. It also implies that volume of the image $u(Z)$ of the set $Z = \{x : \det Du(x) = 0\}$ is zero. So we may assume that $x_0 \notin u(Z)$. Near each point $x \in u^{-1}\{x_0\}$, u is injective with smooth inverse (see Evans, p.632). Finally we let η approximate the point mass at x_0 to conclude that the formula for $\deg(u, x_0)$ is $\sum_{x \in K \cap u^{-1}\{x_0\}} \text{sign}(\det Du(x))$.

For #7 of p.290, first verify that the weak derivative for the function $f(t) = |t|$ corresponds to (integration against) the usual pointwise derivative $f'(t) = \text{sign } t$. By a similar argument one may treat each weak partial derivatives of the function in #7.

For #7 of p.488, try to write $L(Du)$ as the divergence of a vectorfield, and note by the divergence theorem that $\int_U L(Du)$ here depends only on the boundary values of u .