(47) $f(x,y) = x^2 y$ $(-1,0)$ $(-1,5)$ $(1,5)$ $(1,0)$

$x \in [-1,1]$ $y \in [0,5]$

$$\int_{-1}^{1} \int_{0}^{5} x^2 y \, dy \, dx = \int_{-1}^{1} \left[\frac{1}{2} x^2 y^2\right]_0^5 dx = \int_{-1}^{1} \frac{25}{2} x^2 \, dx$$

$$= \left[\frac{25}{6} x^3\right]_{-1}^{1} = \frac{25}{3}$$

$R = [-1,1] \times [0,5]$

$A = 2 \cdot 5 = 10$

$$f_{avg} = \frac{1}{A} \iint_R f(x,y) \, dA$$

$$= \frac{1}{10}\left(\frac{25}{3}\right) = \frac{25}{30} = \boxed{\frac{5}{6} = f_{avg}}$$