6.19.

$$\iint_D f(x,y)\,dxdy = \iint_{D_{uv}} f(x(u,v),y(u,v))\left|\frac{d(x,y)}{d(u,v)}\right|dudv$$

Sätt:

$$\begin{cases} u = x + y \\ v = x - y \end{cases}$$

Funktionaldeterminanten

$$\frac{d(u,v)}{d(x,y)} = \begin{vmatrix} 1 & 1 \\ 1 & -1 \end{vmatrix} = -2$$

$$\left|\frac{d(x,y)}{d(u,v)}\right| = \frac{1}{|-2|} = \frac{1}{2}$$

$$\iint_D (x^2 - y^2)^{10}\, dxdy = \iint_{D_{uv}} (uv)^{10}\, \frac{1}{2}\, dudv$$

$$\iint_{D_{uv}} (uv)^{10}\, \frac{1}{2}\, dudv = \frac{1}{2} \int_{u=-1}^{1} u^{10}\, du \int_{v=-1}^{1} v^{10}\, dv$$

SVAR:

$$\iint_D (x^2 - y^2)^{10}\, dxdy = \frac{1}{2} \;\; 2 \;\; 2 \;\; \frac{1}{11} \;\; \frac{1}{11} = \frac{2}{121}$$