

$$M \subset \mathbb{R}^2$$

M je omezena:

$$\begin{aligned} x - 4y &= -7 \\ x - 4y &= -13 \end{aligned}$$

$$\begin{aligned} 2x - y &= 0 \\ 2x - y &= 7 \end{aligned}$$

Parametrizace:

$$\begin{aligned} u &= x - 4y \\ v &= 2x - y \end{aligned}$$

$$\begin{aligned} u &\in [-13; -7] \\ v &\in [0; 7] \end{aligned}$$

$$\begin{aligned} y &= \frac{1}{4}(x - u) \\ y &= 2x - v \end{aligned}$$

$$\begin{aligned} \frac{1}{4}(x - u) &= 2x - v \\ x - u &= 8x - 4v \\ 7x &= 4v - u \\ x &= \frac{1}{7}(4v - u) \end{aligned}$$

$$\begin{aligned} x &= u + 4y \\ x &= \frac{1}{2}(y + v) \end{aligned}$$

$$\begin{aligned} u + 4y &= \frac{1}{2}(y + v) \\ 2u + 8y &= y + v \\ 7y &= v - 2u \\ y &= \frac{1}{7}(v - 2u) \end{aligned}$$

$$|\text{Det } D\alpha| = \begin{vmatrix} \frac{\partial x}{\partial u} & \frac{\partial y}{\partial u} \\ \frac{\partial x}{\partial v} & \frac{\partial y}{\partial v} \end{vmatrix} = \begin{vmatrix} \frac{-1}{7} & \frac{-2}{7} \\ \frac{4}{7} & \frac{1}{7} \end{vmatrix} = \frac{-1}{49} + \frac{8}{49} = \frac{1}{7}$$

$$S_M = \int_0^7 \int_{-13}^{-7} \frac{1}{7} du dv = \frac{1}{7}(7-0)(-7+13) = \underline{\underline{6}}$$