

916.e.

$$M = \int_K xy^2 z^3 dx dy dz$$

**K** begränsas av ytan  $z = xy$  och planen  $y = x$ ,  $x = 1$  och  $z = 0$ .

$$M = \int_{D_{xy}} \left( \int_{z=0}^{xy} xy^2 z^3 dz \right) dx dy = \int_{D_{xy}} xy^2 \frac{(xy)^4}{4} dx dy$$

$$M = \frac{1}{4} \int_{y=0}^1 \left( \int_{x=y}^1 x^5 y^6 dx \right) dy = \frac{1}{4} \int_{y=0}^1 \frac{1}{6} y^6 y^6 dy$$

$$M = \frac{1}{24} \left( \frac{1}{7} - \frac{1}{13} \right) = \frac{1}{4 \cdot 7 \cdot 13} = \frac{1}{364}$$

916.m.

$$M = \int_{\mathbf{K}} dx dy dz du$$

$$\mathbf{K} = \{(x, y, z, u) : |x| + |y| + |z| + |u| \leq 1\}$$

$$M = 16 \int_{\mathbf{K}_1} dx dy dz du$$

$$\mathbf{K}_1 = \{(x, y, z, u) : x + y + z + u \leq 1, x \geq 0, y \geq 0, z \geq 0, u \geq 0\}$$

$$M = 16 \int_{\mathbf{K}_2} \left( \int_{u=0}^{1-x-y-z} du \right) dx dy dz$$

$$\mathbf{K}_2 = \{(x, y, z) : x + y + z \leq 1, x \geq 0, y \geq 0, z \geq 0\}$$

$$M = 16 \int_{D_{xy}} \int_{z=0}^{1-x-y} (1-x-y-z) dz dx dy$$

$$D_{xy} = \{(x, y) : x + y \leq 1, x \geq 0, y \geq 0\}$$

$$M = 16 \int_{x=0}^1 \int_{y=0}^{1-x} \frac{1}{2} (1-x-y)^2 dy dx = \frac{8}{3} \int_{x=0}^1 (1-x)^3 dx$$

$$M = \frac{8}{3} \cdot \frac{1}{4} = \frac{2}{3}$$