$z = f(x,y)$ dla $(x,y) \in D$

$$P = \iint_D \sqrt{1 + (f_x)^2 + (f_y)^2}\, dx\, dy$$

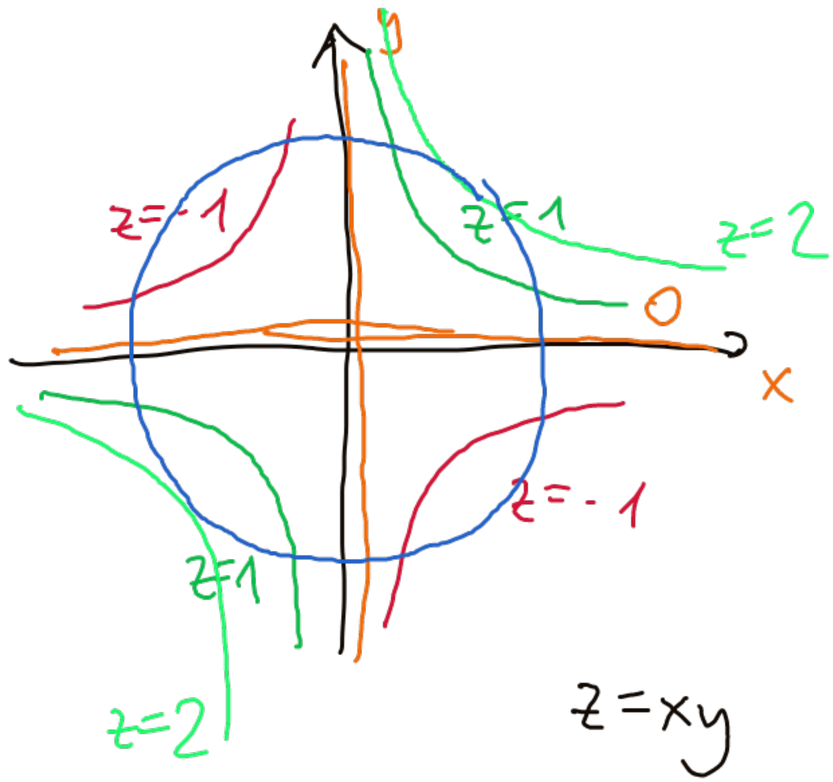
$f(x,y) = xy \qquad f_x = y \qquad f_y = x$

$$P = \iint_D \sqrt{1+y^2+x^2}\, dx\, dy =$$

$$= \int_0^{2\pi} d\varphi \int_0^{\sqrt{2}} \sqrt{1+r^2}\, r\, dr = \left\{ \begin{array}{l} t = 1+r^2 \\ dt = 2r\, dr \\ \frac{1}{2} dt = r\, dr \end{array} \right\}$$

$$= \int_0^{2\pi} d\varphi \int_1^3 \sqrt{t} \cdot \frac{1}{2} dt = \int_0^{2\pi} d\varphi \cdot \frac{1}{2} \left. \frac{t^{3/2}}{3/2} \right|_1^3 =$$

$$= \int_0^{2\pi} \frac{1}{2} \frac{2}{3} \left(3^{3/2} - 1\right) d\varphi = 2\pi \cdot \frac{1}{2} \cdot \frac{2}{3} \left(3^{3/2} - 1\right)$$



$z = xy$

$xy = -1$ $\quad xy = 1$ $\quad xy = 2$

$y = -\frac{1}{x}$ $\quad y = \frac{1}{x}$ $\quad y = \frac{2}{x}$

$x^2 + y^2 \le 2$ $\quad \left\{ \begin{array}{l} x = r\cos\varphi \\ y = r\sin\varphi \end{array} \right.$ $\quad r \ge 0$

$r^2 \le 2$ $\quad r \in [0, \sqrt{2}]$ $\quad \varphi \in [0, 2\pi]$