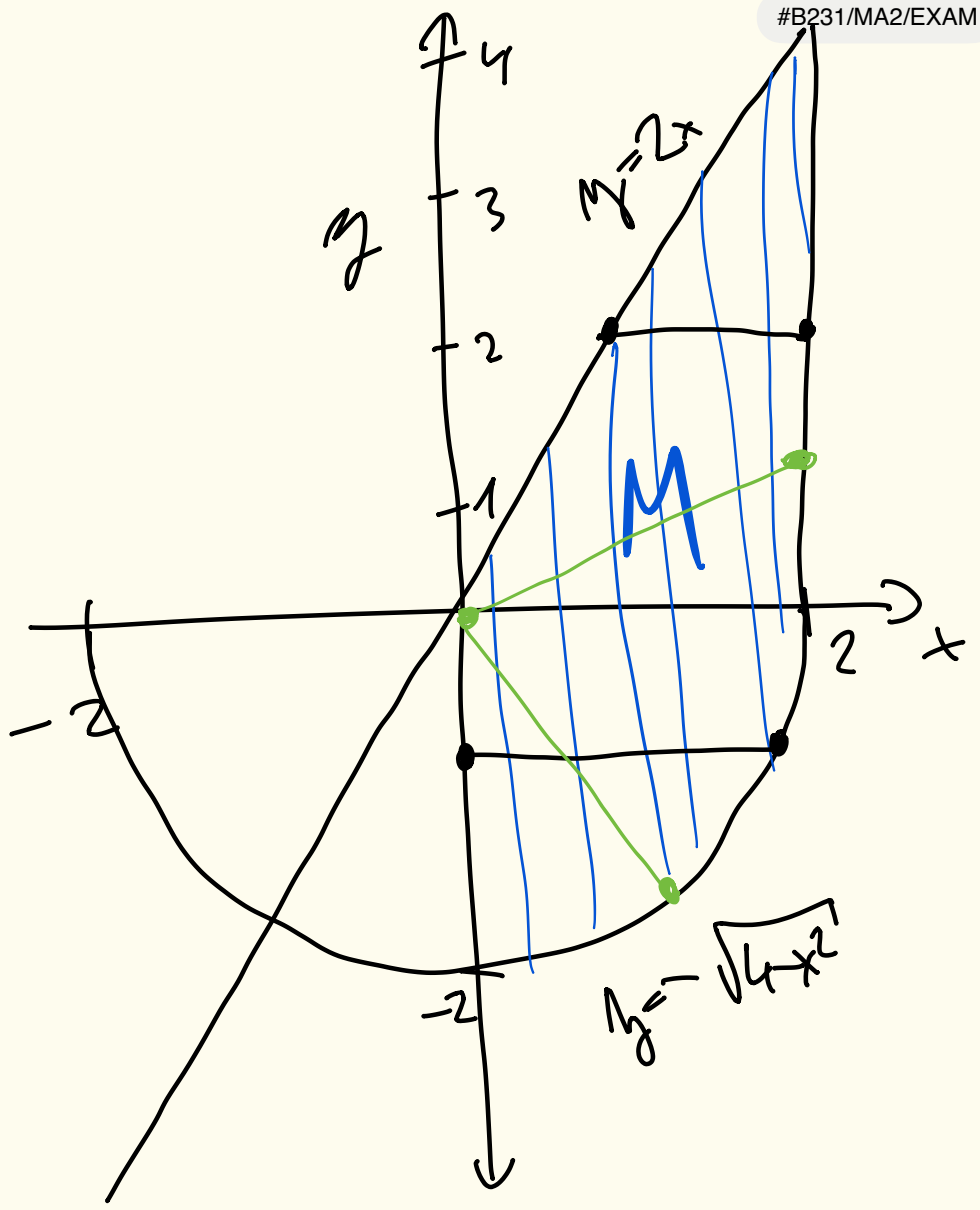
$$\int_0^2 \int_{-\sqrt{4-x^2}}^{2x} f \, dy \, dx =$$

(a) změna pořadí integrace

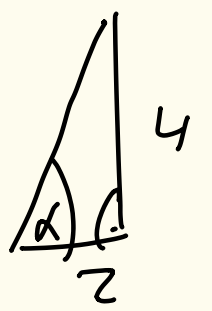
$$= \iint_M f \, dA = \int_{-2}^{0} \int_{0}^{\sqrt{4-y^2}} f \, dx \, dy +$$

$$+ \int_0^4 \int_{1/2\,y}^{2} f \, dx \, dy$$



(b) přes polární souřadnice $x = r\cos\varphi$, $y = r\sin\varphi$

$$= \int_{-\pi/2}^{0} \int_{0}^{2} f \, r \, dr \, d\varphi + \int_{0}^{\tan^{-1}2} \int_{0}^{\frac{2}{\cos\varphi}} f \, r \, dr \, d\varphi$$



$\tan\alpha = 2$

$\alpha = \tan^{-1} 2$

$x = 2$

$r\cos\varphi = 2$

$r = \frac{2}{\cos\varphi}$

$$\lim_{(x,0)\to(0,0)} \frac{x\sin y}{x^2+y^2} = \lim_{(x,y)\to(0,0)} \frac{x\sin kx}{x^2+x^2k^2} =$$

$y = kx$

$$= \lim_{(x,y)\to(0,0)} \frac{x\sin kx}{x^2(1+k^2)} = \lim_{(x,y)\to(0,0)} \frac{\sin kx}{x(1+k^2)} =$$