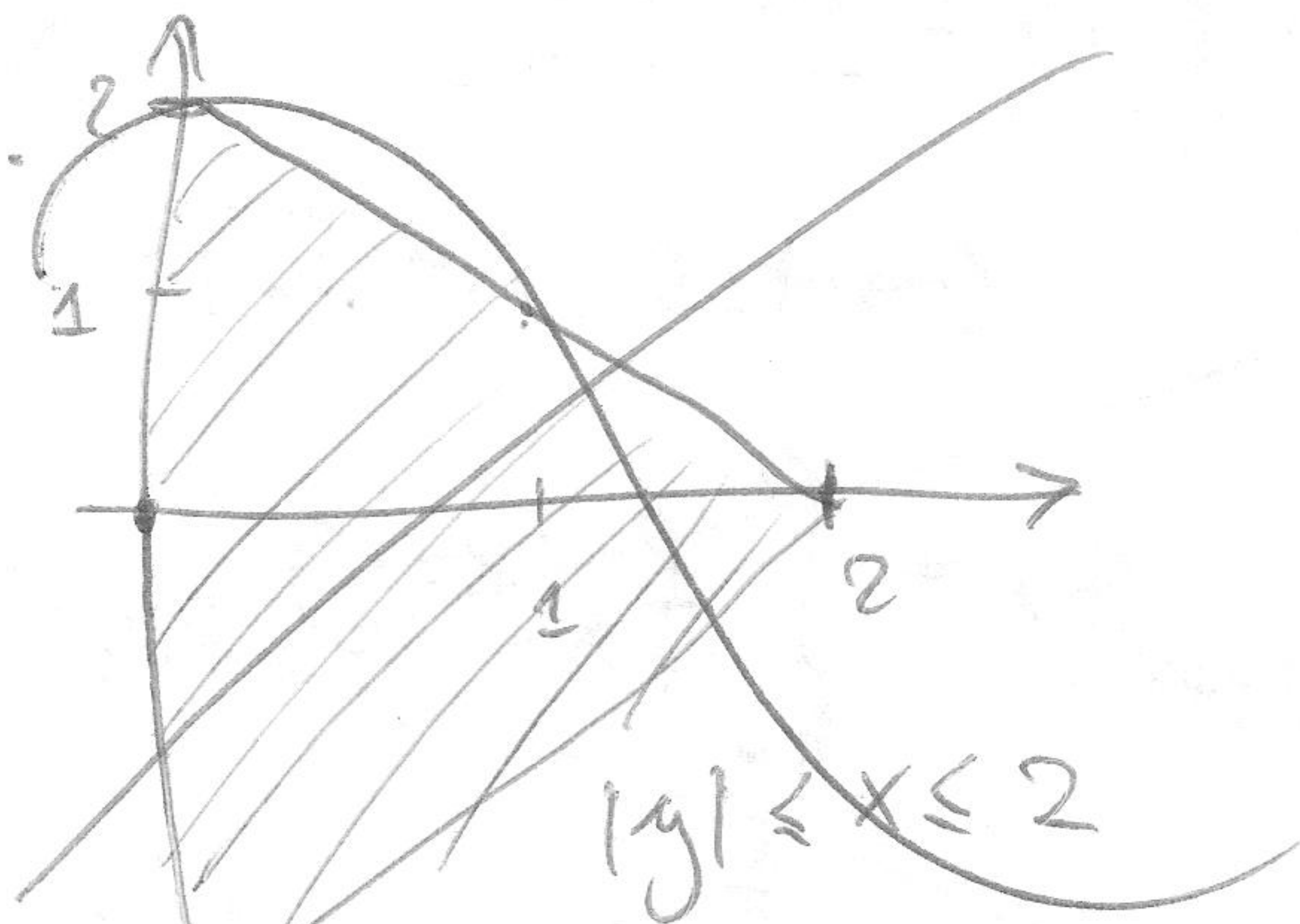
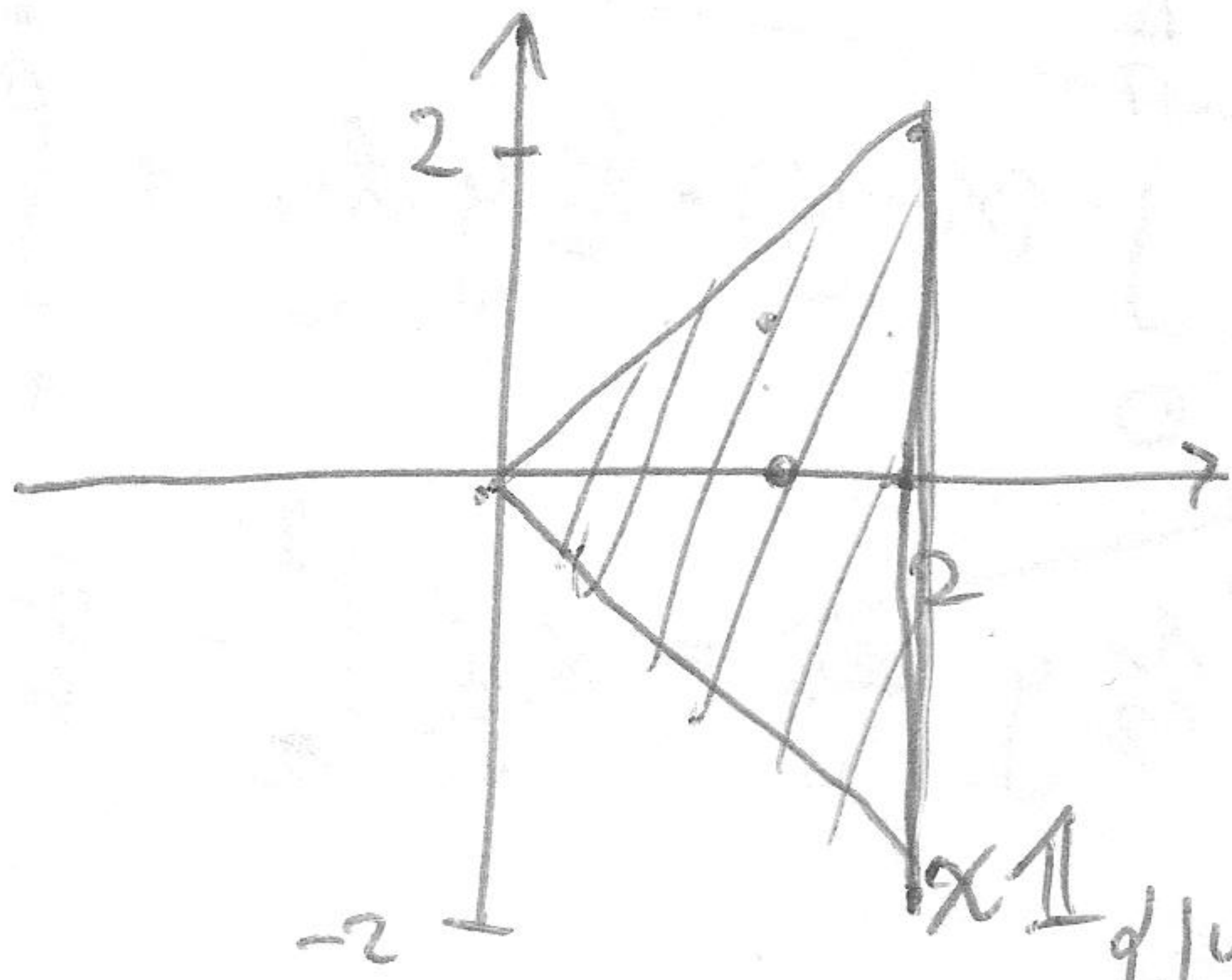


Zad. 1

a) Chcemy, żeby  $\int_{\mathbb{R}^2} g(x,y) dx dy = 1$



Chcemy  $\int_{\mathbb{R}^2} g(x,y) dx dy = 1$

Czyli  $\int_0^x \int_{-x}^x c x dy dx = 1$

~~Wzrost = 1, stała~~

b)  $\mu_x(A) = P[X \in A, Y \in \mathbb{R}] = \int_{A \times \mathbb{R}} g(x,y) dx dy = \int_A \int_{\mathbb{R}} g(x,y) dy dx$  (TW. Fubini)

$= \int_A \int_{-x}^x g(x,y) dy dx = \int_A \dots$

KONTYNUACJA a)

$\int_0^x \int_{-x}^x c x dy dx = 1/c$

$\int_0^x y x |_{-x}^x dx = \int_0^2 2x^2 dx = \frac{2}{3} x^3 |_0^2 = \frac{16}{3}$

Czyli  $c = 3/16$

$= \int_A \int_{-x}^x \frac{3}{16} x \mathbb{1}_{|y| \leq x \leq 2} dy dx =$

$= \int_A \frac{3}{16} y x |_{-x}^x dx = \int_A \frac{3}{8} x^2 dx$ , czyli  $f_x(x) = \frac{3}{8} x^2 \cdot \mathbb{1}_{[0,2]}$

(oczywiście myślimy, że  $f_x$  określone na  $[0,2]$ )

$\mu_y(A) = P[X \in \mathbb{R}, Y \in A] =$

$\int_{\mathbb{R}} \int_A \frac{3}{16} x dx dy = \int_A \frac{3}{8} x^2 |_{|y|}^2 dy = \int_{-2}^2 \frac{3}{8} - \frac{3}{32} y^2 dy$  (Fubini)

Czyli  $f_y(y) = \left[ \frac{3}{8} - \frac{3}{32} y^2 \right] \cdot \mathbb{1}_{[-2,2]}$

(Spr.  $\int_0^2 \frac{3}{8} x^2 dx = \frac{1}{8} x^3 |_0^2 = 1$ ,  $\int_{-2}^2 \frac{3}{8} - \frac{3}{32} y^2 dy = \frac{3}{8} y - \frac{1}{32} y^3 |_{-2}^2 = \frac{3}{4} - \frac{1}{4} + \frac{3}{4} - \frac{1}{4} = 1$ )