

Exercício:  
(2) h)  $z = e^{\frac{x}{y}}$

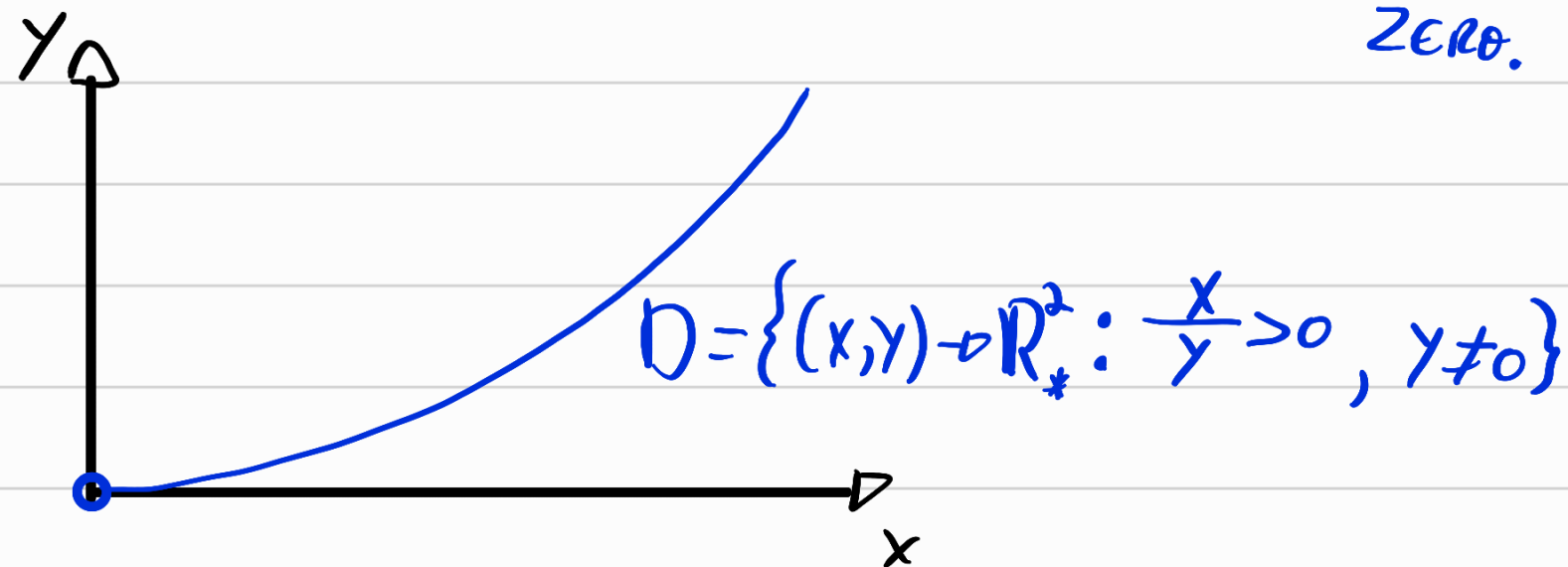
$$X: (-\infty, +\infty)$$
$$Y: (-\infty, 0), (0, +\infty)$$

(I)  $\text{Dom}(f): \mathbb{R}^2_*$

O domínio é todo  $\mathbb{R}^2$  exceto o zero, pois

(II)  $\text{Im}(f): (0, +\infty)$

Y NÃO ESTÁ DEFINIDO EM ZERO.



(4) CURVAS DE NÍVEL E O GRÁFICO DAS SEGUINTE FUNÇÕES

a)  $h(x,y) = 4x^2 + y^2$

(I)  $\text{Dom}(h): \mathbb{R}^2$

(II)  $\text{Im}(h): (-\infty, +\infty)$

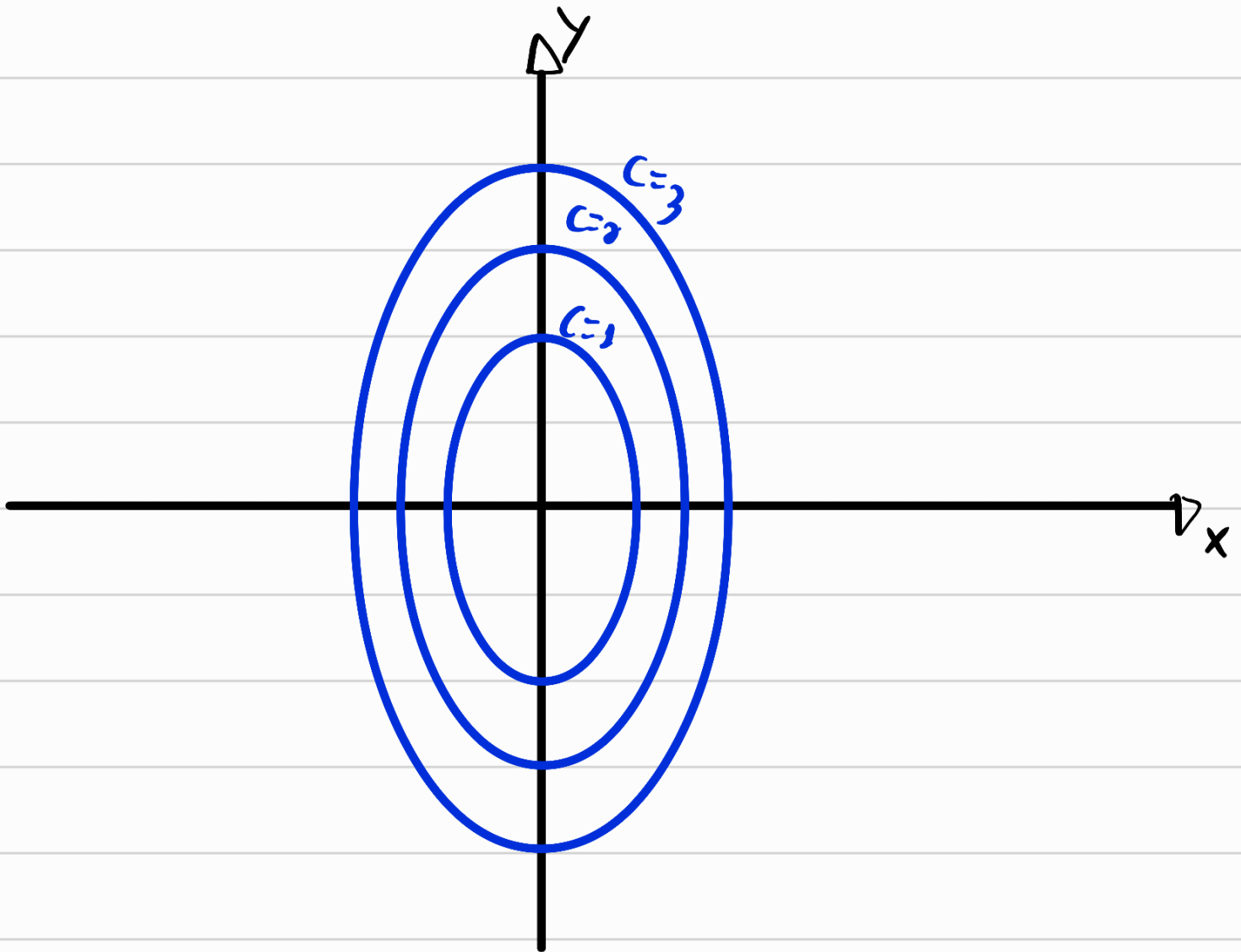
(III)  $h(x,y) = 4x^2 + y^2 = c$

$$4x^2 + y^2 = C$$

$$y^2 = C - 4x^2$$

$$C = \{1, 2, 3\}$$

$$y = \pm \sqrt{C - 4x^2}$$

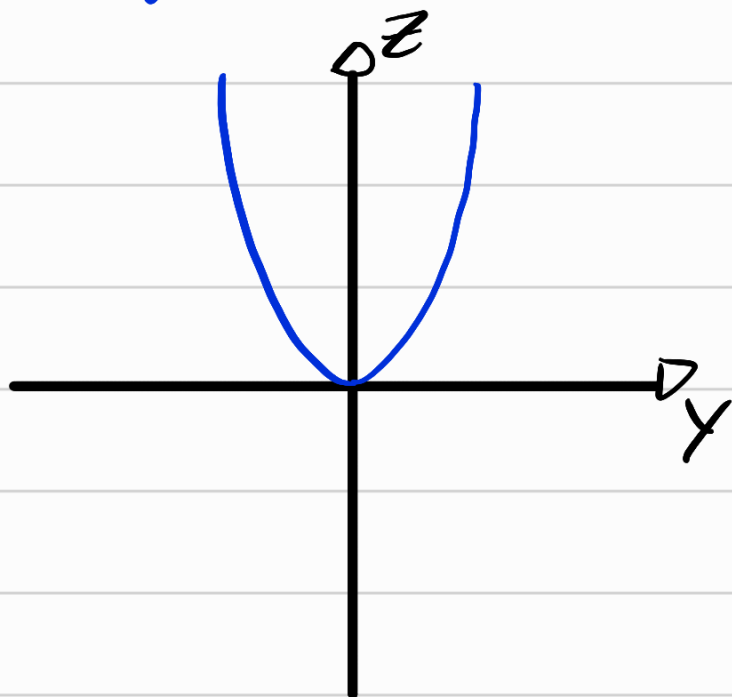


④  $O_{yz} (x=0)$

$$h(x,y) = 4x^2 + y^2$$

$$h(0,y) = 4 \cdot 0^2 + y^2$$

$$h(0,y) = y^2$$

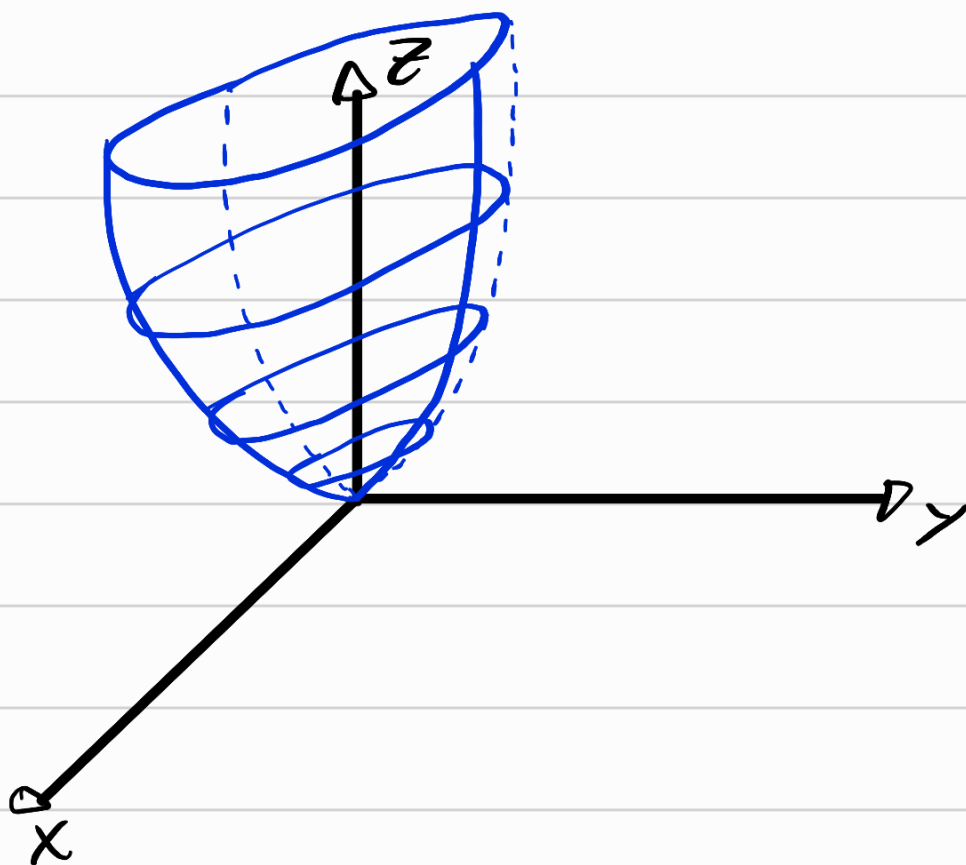
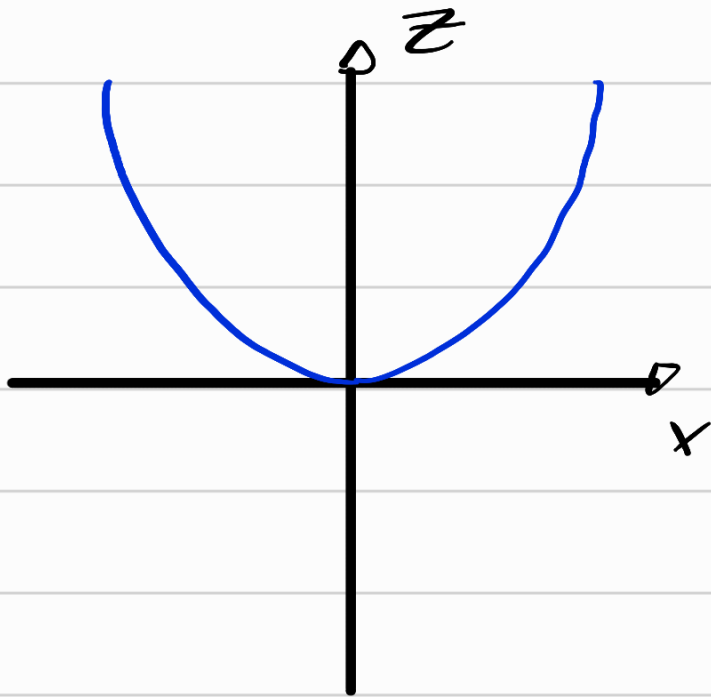


⑤  $O_{xz} (y=0)$

$$h(x,y) = 4x^2 + y^2$$

$$h(x,0) = 4 \cdot x^2 + 0$$

$$h(x,0) = 4x^2$$



$$b) f(x, y) = y^2 - x^2$$

$$\text{Dom}(f) = \mathbb{R}^2$$

$$\text{Im}(f) = \mathbb{R}$$

$$\textcircled{\text{III}} f(x, y) = y^2 - x^2 = c$$

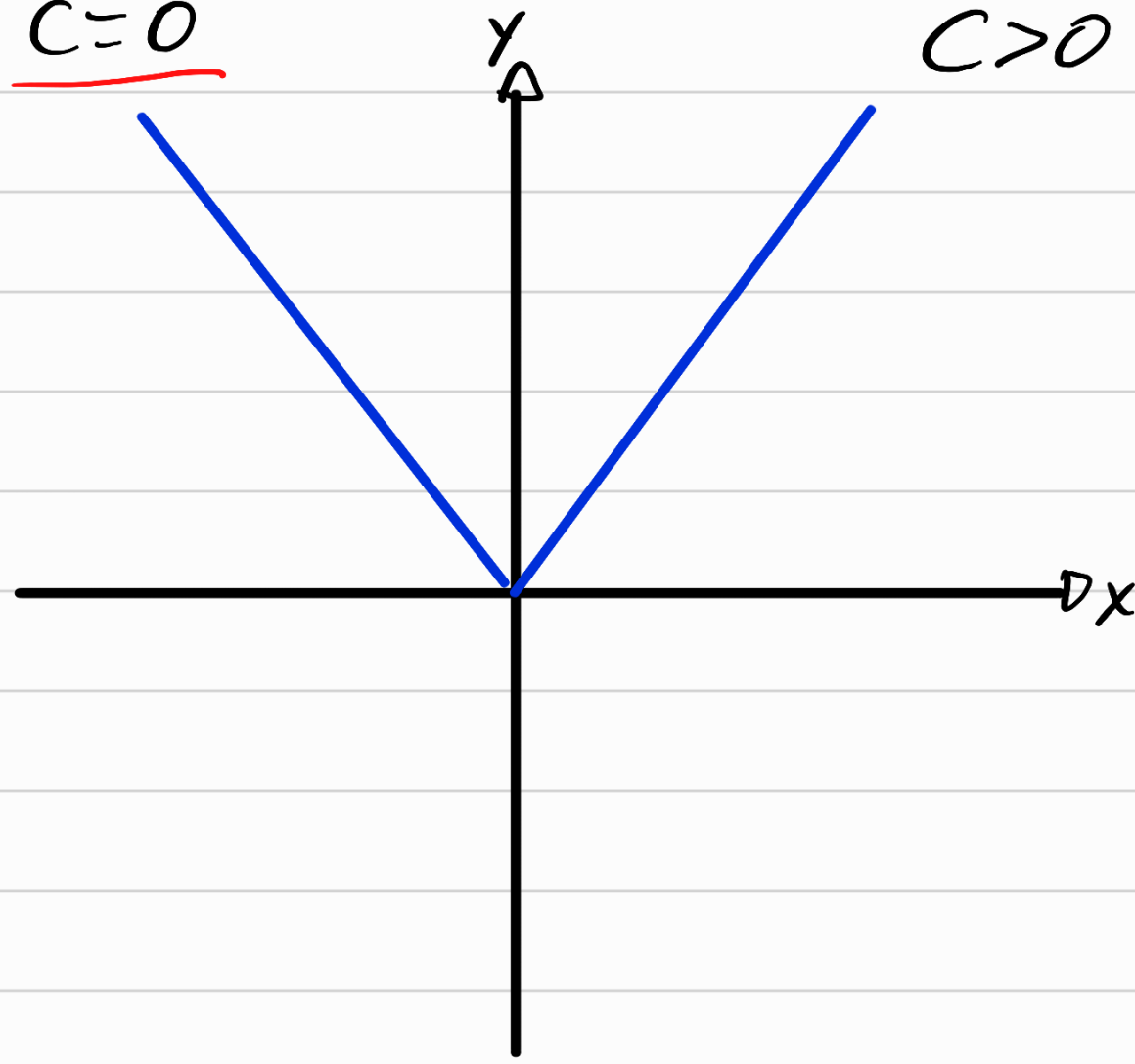
$$y^2 = x^2 + c$$

$$y = \pm \sqrt{x^2 + c}$$

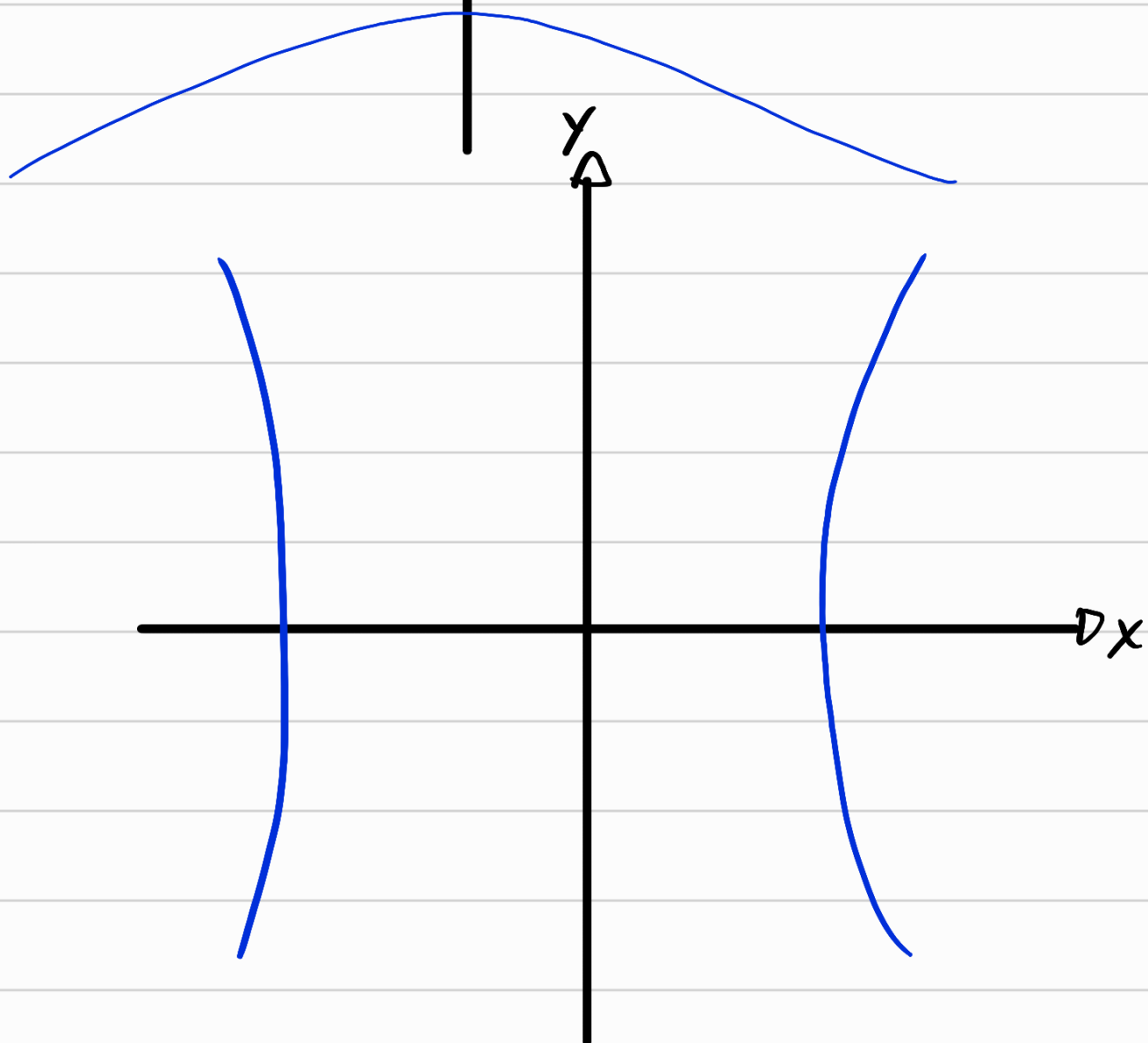
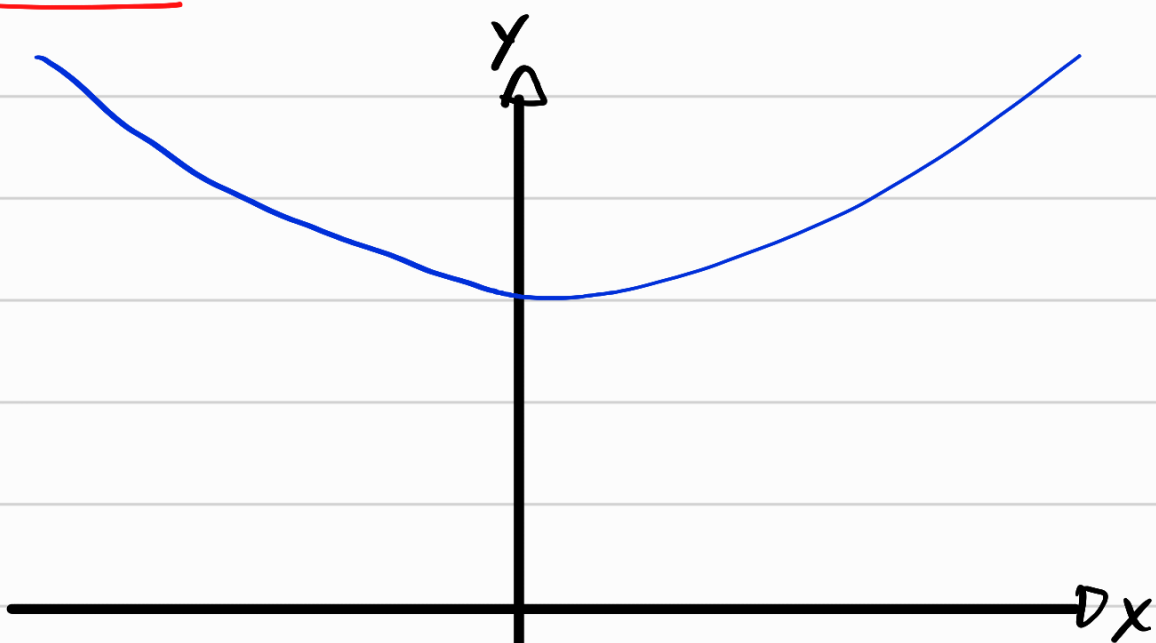
$$c = \{-2, -1, 0, 1, 2\}$$

$$\underline{c = 0}$$

$$c > 0 \quad c = 0 \quad c < 0$$



$C > 0$



$$\textcircled{\text{IV}} \quad O_{yz} \quad (x=0)$$

$$f(x,y) = y^2 - x^2$$

$$\begin{aligned} f(0,y) &= y^2 - 0^2 \\ &= y^2 \geq 0 \end{aligned}$$

$$\textcircled{\text{V}} \quad O_{xz} \quad (y=0)$$

$$\begin{aligned} f(x,0) &= 0 - x^2 \\ &= -x^2 \leq 0 \end{aligned}$$

