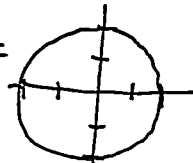
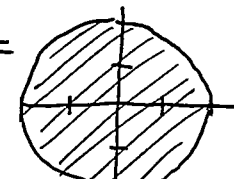
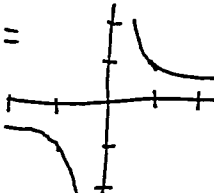



$$F(x,y) = \begin{array}{ccccc} 8 & 5 & 4 & 5 & 8 \\ 5 & 2 & 1 & 2 & 5 \\ 4 & 1 & 0 & 1 & 4 \\ 5 & 2 & 1 & 2 & 5 \\ 8 & 5 & 4 & 5 & 8 \end{array}$$

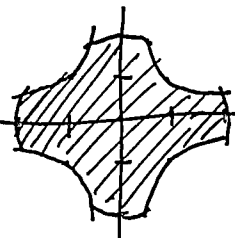
$$G(x,y) = \begin{array}{ccccc} -4 & -2 & 0 & 2 & 4 \\ -2 & -1 & 0 & 1 & 2 \\ 0 & 0 & 0 & 0 & 0 \\ 2 & 1 & 0 & -1 & -2 \\ 4 & 2 & 0 & -2 & -4 \end{array}$$

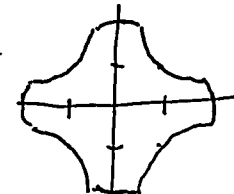
$$C_1 = F^{-1}(4) =$$


$$C_2 = F^{-1}([-1, 4]) =$$


$$C_3 = G^{-1}(1) =$$


$$C_4 = G^{-1}([-1, 1]) =$$


$$C_5 = C_2 \cap C_4 =$$


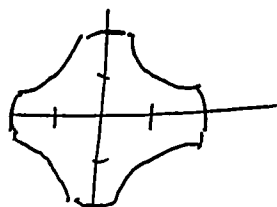
$$C_6 = \partial C_5 =$$


$$D = C_5$$

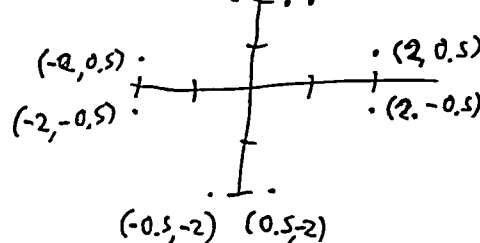
$$H(x,y) = (x-x_0)^2 - (y-y_0)^2 \\ = (x-1)^2 - (y-0)^2$$

$$= \begin{array}{ccccc} 0 & -3 & -4 & -3 & 0 \\ 3 & 0 & -1 & 0 & 3 \\ 4 & 1 & 0 & 1 & 4 \\ 3 & 0 & -1 & 0 & 3 \\ 0 & -3 & -4 & -3 & 0 \end{array}$$

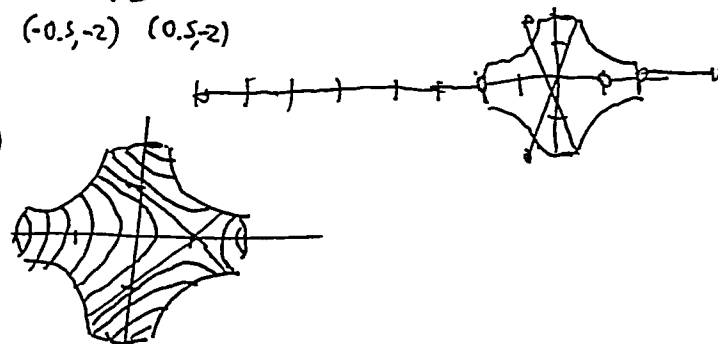
ESBOÇO
DE
GABARITO

$$a) D =$$


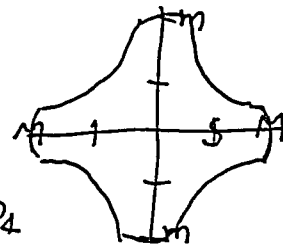
$$b) \text{COORDENADAS APROXIMADAS DOS PICOS:}$$

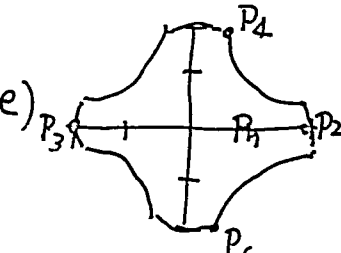


$$c)$$



$$d) \begin{array}{l} S - \text{SELA} \\ M - \text{MÁXIMO} \\ m - \text{MÍNIMO} \end{array}$$



$$e) \begin{array}{c} P_4 \\ P_3 \quad P_1 \quad P_2 \\ P_5 \end{array}$$


$$\begin{array}{l} P_1 = (1, 0) \\ P_2 = (2, 0) \\ P_3 = (-2, 0) \\ P_4 = (0.5, 2) \\ P_5 = (0.5, -2) \end{array}$$

$$f) \nabla H = (H_x, H_y) \\ = (2(x-1), -2y)$$

$$\nabla H(P_1) = (0, 0)$$

$$\nabla H(P_2) = (2, 0)$$

$$\nabla H(P_3) = (-2, 0)$$

$$\nabla H(P_4) = (0, -2)$$

$$\nabla H(P_5) = (0, 2)$$