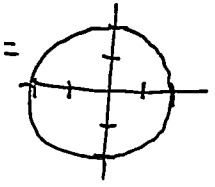
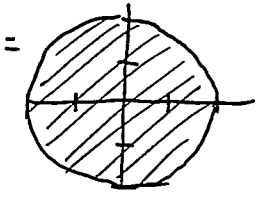
$F(x,y) =$

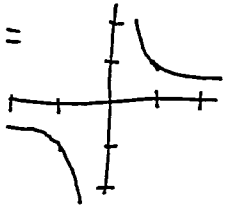
8	5	4	5	8
5	2	1	2	5
4	1	0	1	4
5	2	1	2	5
8	5	4	5	8

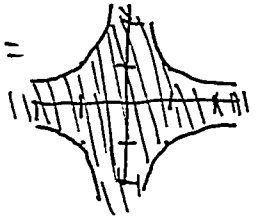
$G(x,y) =$

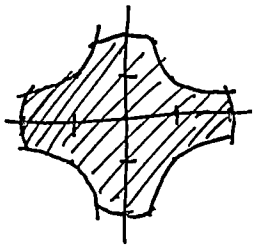
-4	-2	0	2	4
-2	-1	0	1	2
0	0	0	0	0
2	1	0	-1	-2
4	2	0	-2	-4

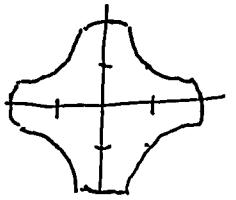
$C_1 = F^{-1}(4) =$ 

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

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

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

$C_5 = C_2 \cap C_4 =$ 

$C_6 = \partial C_5 =$ 

$D = C_5$

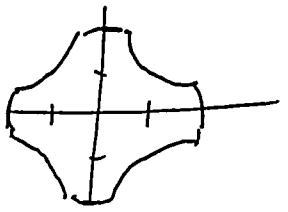
$H(x,y) = (x-x_0)^2 - (y-y_0)^2$

$= (x-1)^2 - (y-0)^2$

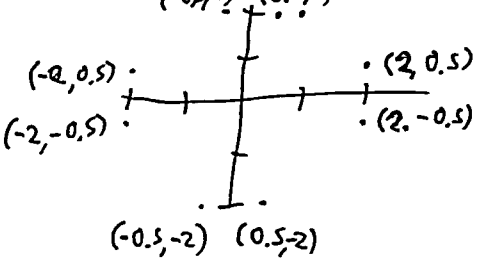
=

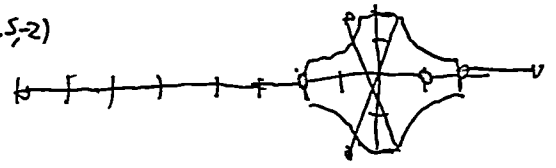
0	-3	-4	-3	0
3	0	-1	0	3
4	1	0	1	4
3	0	-1	0	3
0	-3	-4	-3	0

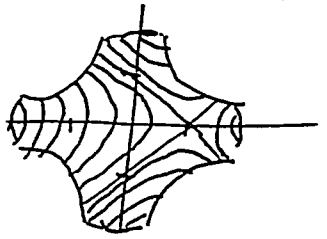
ESBOÇO DE GABARITO

a) $D =$ 

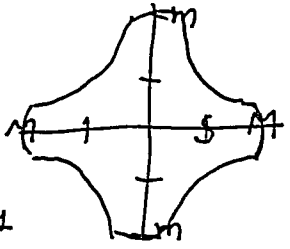
b) COORDENADAS APROXIMADAS DOS BICOS:

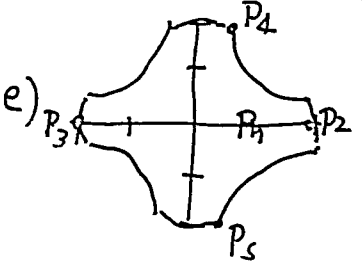




c) 

d) S - SELA
M - MÁXIMO
m - MÍNIMO



e) 

$P_1 = (1,0)$
$P_2 = (2,0)$
$P_3 = (-2,0)$
$P_4 = (0.5,2)$
$P_5 = (0.5,-2)$

f) $\nabla H = (H_x, H_y)$

$= (2(x-1), -2y)$

$\nabla H(P_1) = \overrightarrow{(0,0)}$

$\nabla H(P_2) = \overrightarrow{(2,0)}$

$\nabla H(P_3) = \overrightarrow{(-6,0)}$

$\nabla H(P_4) = \overrightarrow{(-1,-4)}$

$\nabla H(P_5) = \overrightarrow{(-1,4)}$