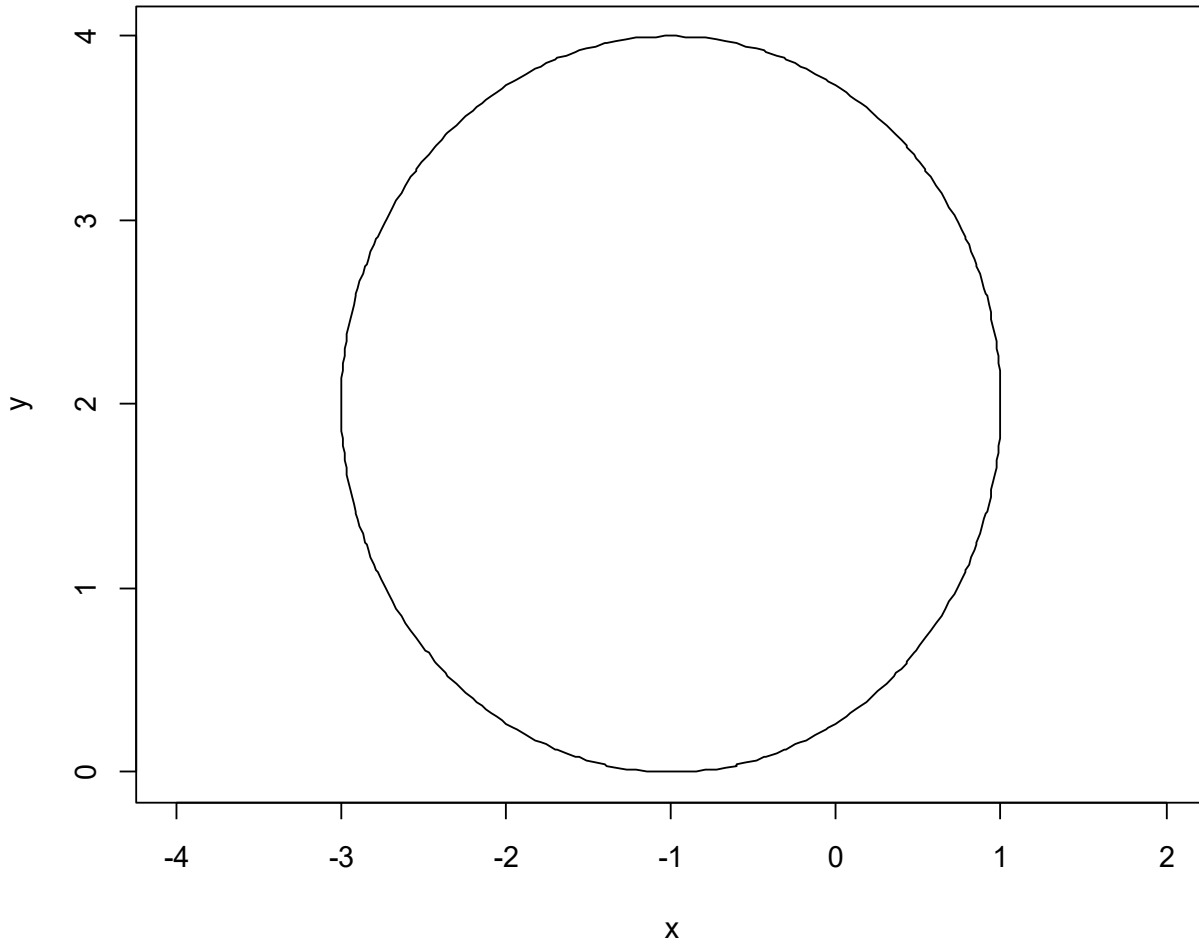


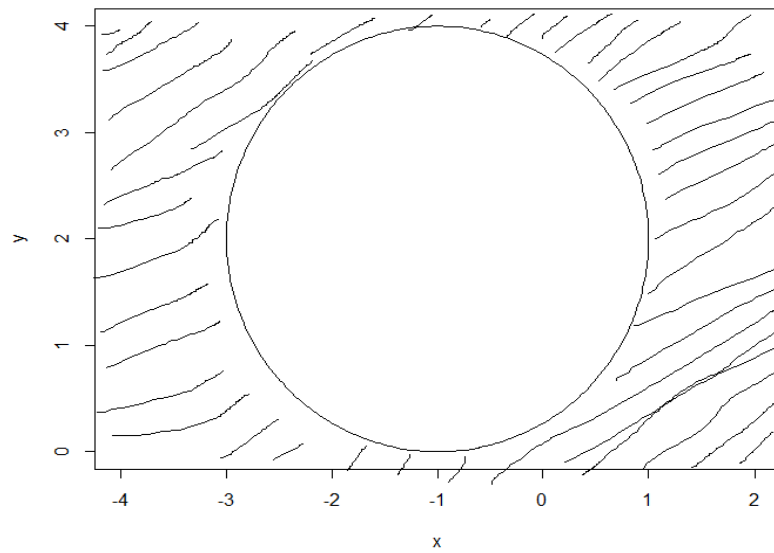
a)

Circle: $(1+x)^2 + (2-y)^2 = 4$



b)

Circle: $(1+x)^2 + (2-y)^2 = 4$



c)

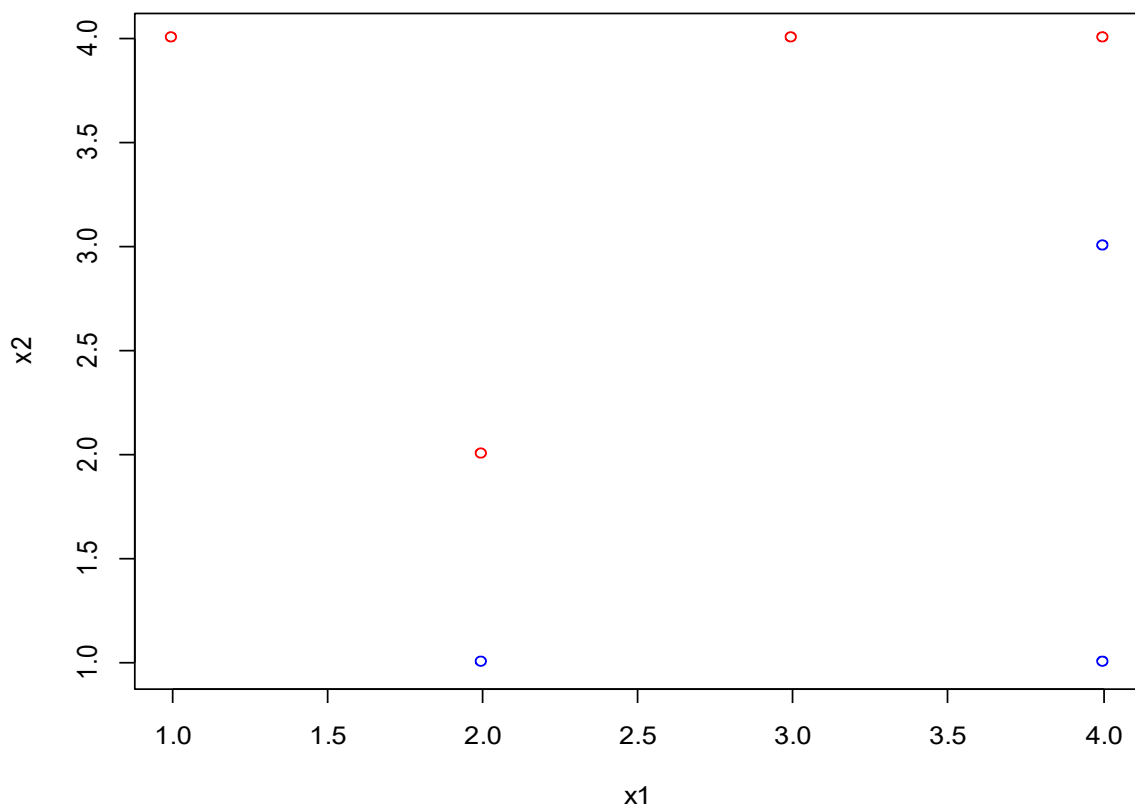
X1	X2	$(1+X1)^2+(2-X2)^2$	Class
0	0	5	Blue
-1	1	1	Red
2	2	9	Blue
3	8	52	Blue

d)

$$(1+x1)^2+(2-x2)^2 > 4 \Rightarrow 2x1 + x1^2 - 4x2 - x2^2 > -1$$

Q3

a)



b)

We'll notice (2,2) and (2,1) form one group (let's call it Group A), and (4,3) and (4,4) form another group (Group B).

The midpoint between the points in Group A: $((2+2)/2, (2+1)/2) = (2, 1.5)$

The midpoint between the points in Group B: $((4+4)/2, (3+4)/2) = (4, 3.5)$

The slope of the line connecting the midpoints is $(3.5 - 1.5) / (4 - 2) = 2 / 2 = 1$.

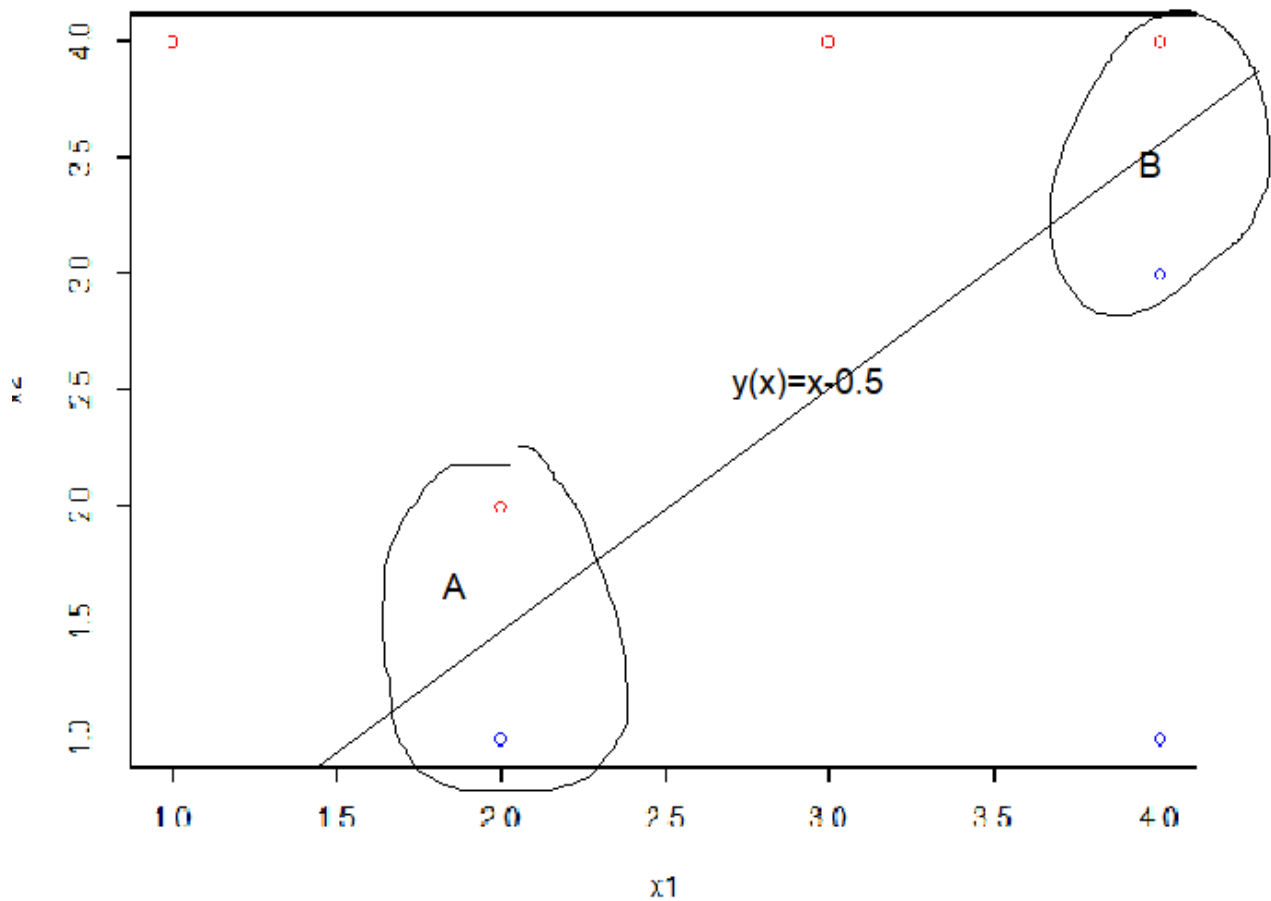
$$(y = x^2)$$

To find b in the equation $y(x) = ax+b$ we will substitute one of our points:

$$y(2) = 1.5$$

$$y(2) = ax+b = 1 \cdot x=b \Rightarrow 2+b = 1.5 \Rightarrow b = -0.5$$

$$y(x) = x-0.5$$



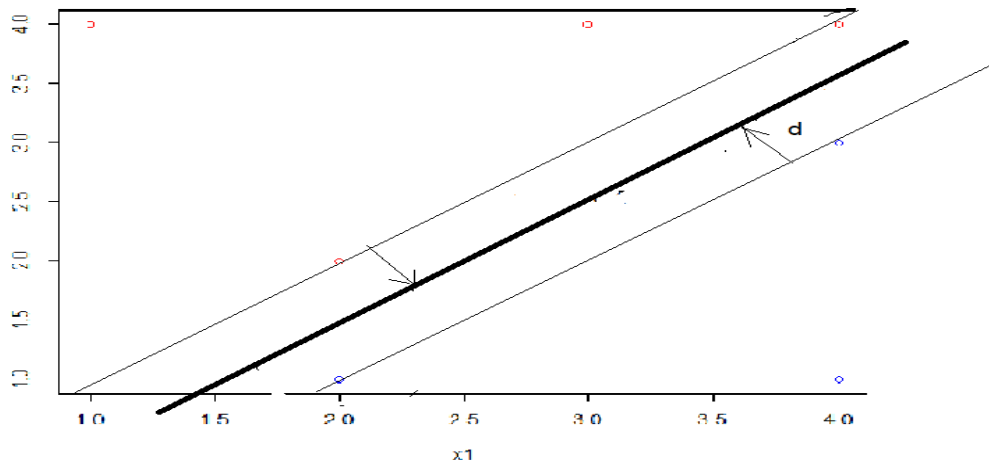
$$y(x)=x^2 \Rightarrow x_2 = x_1-0.5 \Rightarrow 0.5 - x_1 + x_2 = 0$$

c)

Classify to red if $0.5 - x_1 + x_2 > 0$

$$b_0 = 0.5, b_1 = -1, b_2 = 1$$

d)

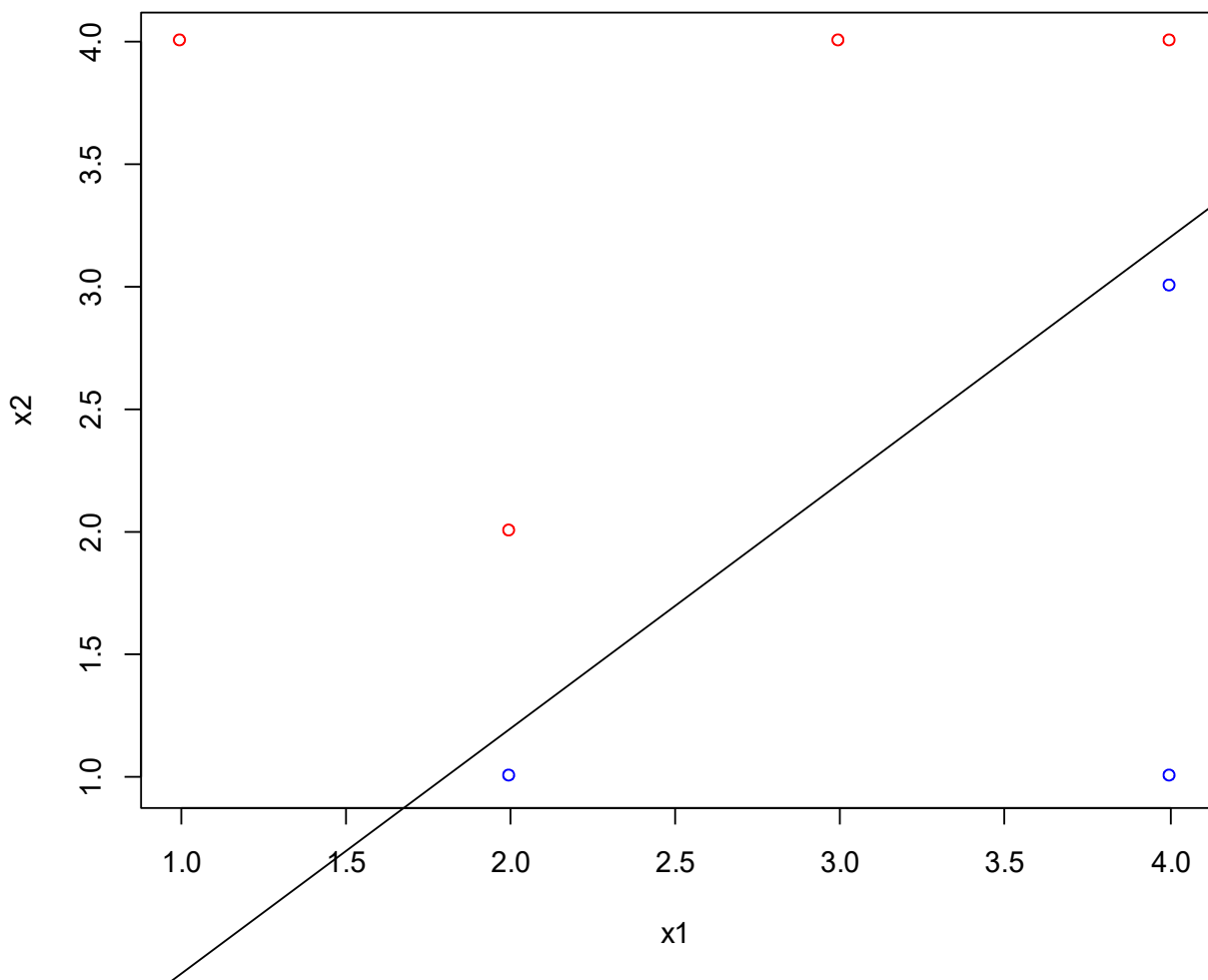


e) depicted in (b)

f)

(4,1) is outside of the margin, and can be moved in the space that is outside of the margin – this will not alter hyperline.

g) $y(x) = x - 0.8$ ($0.8 - x_1 + x_2 = 0$)



h)

+ blue point (1, 2) (see next page)

