FDA - midterm exam

Part 1:

a) True

b) True

c) False

d) True

e) True

f) C

g) D h_6

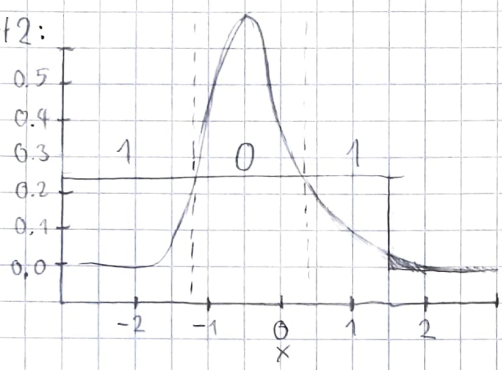
h) B

i) F, A

j) D

k) C

Part 2:



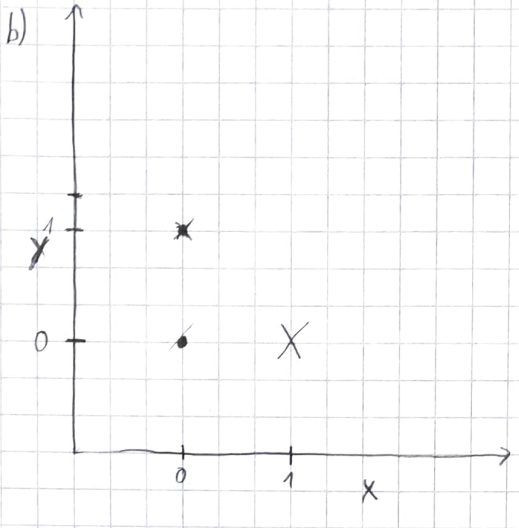
Part 3: a) Convexity, Boundedness, Differentiability

c) The (a) loss function violates Convexity

Part 4: a) Let $j = \text{argmax}_{i \in A} [Gain(S, i)]$

This line makes the algorithm greedy, because it makes the optimal choice at each small stage. Disregarding the big picture.

b)

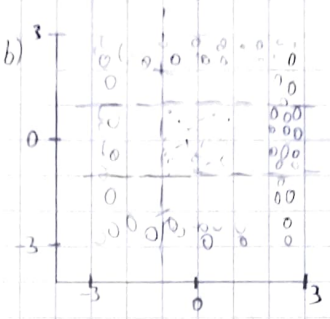


c)

vii) because 2 samples at the exact same position have different labels.

Part 5: a) $VC = 3^3 = 27$

b)



c) $\frac{2}{24}$ Training error

d) 4 → Red
3 → Green
2 → Orange
1 → Blue

With depth 4 a perfect model can be trained.
With less depth the higher the training error.