Exercise 1: Let (x1, …., xn) € Rn be a set of samples. Show that for all a € R,

Solution:

= [Add and subtract from the expression]

= + 2 \* + [Take (xi - ) = a and ( – a) = b then apply (a + b) ^ 2 = a^2 + 2ab + b^2]

……………………………… (1)

Now,

2 \*

= 2 \*[[] – [] – [] + []]

= 2 \*[[n \* ^ 2] – [a \* n \* ] – [n \* ^ 2] + [a \* n \* ]]

= 2 \* 0

= 0

Now (1) will be

+

= + n \* ( – a) ^ 2

So,