

# Chapter 0 Exercises

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## Exercise 1

(a)

$$\begin{aligned}\mathbb{E}[\|Z - \mathbb{E}[Z]\|_2^2] &= \mathbb{E}[\|Z\|_2^2 - 2\langle Z, \mathbb{E}[Z] \rangle + \|\mathbb{E}[Z]\|_2^2] \\ &= \mathbb{E}[\|Z\|_2^2] - 2\mathbb{E}[Z]^T \mathbb{E}[Z] + \|\mathbb{E}[Z]\|_2^2 \\ &= \mathbb{E}[\|Z\|_2^2] - \|\mathbb{E}[Z]\|_2^2.\end{aligned}$$