

Any of the following exercises are fair game for your final oral exam. I suggest that you write up your solutions neatly in your own handwriting to consult during that exam! All assigned book exercises are from the textbook available here:

<https://users.math.msu.edu/users/iwenmark/Teaching/MTH994/Fall2022/HDP-book.pdf>.

PROBLEMS ASSIGNED FROM CHAPTER 3

13. Let X be a random vector. Prove that both $\sigma(X)$ and $\text{cov}(X)$ are positive-semidefinite matrices.
14. If a random vector X has independent mean 0 entries with unit second moments, show that $\text{cov}(X)$ is the identity.
15. Do exercise 3.2.2 from the book.
16. Do exercise 3.2.6 from the book.
17. Do exercise 3.3.3 from the book.
18. Do exercise 3.3.5 from the book.
19. Do exercise 3.3.6 from the book.
20. Do exercise 3.3.9 from the book.
21. Do exercise 3.4.3 from the book.
22. Do exercise 3.5.2 from the book.