

MATE 4031 practice set 4: sections 5.1, 5.2

§5.1:

On your own, solve enough problems from 1–10 to ascertain that you remember what you learnt in Calculus II.

28–30. Exercises 12, 13, 16.

§5.2:

31–33. Exercises 3, 7, 11.

34. Show that the two horns of the alternative in Corollary 5.2.5 are exclusive. Hint: show that if $Ax = b$ has a solution, then the system $A^T y = 0$, $b^T y \neq 0$ has no solution y .

35–37. Exercises 13, 16, 17. Hint for 35(b) (which is 13(b) of text): to show $N(A^T A) \subset N(A)$ ($N(A) \subset N(A^T A)$ is easy), let $x : A^T A x = 0$, and multiply both sides by x^T . Once you established (b), show that (c) follows.

As a rule, if in these problems you are stuck on one part, but are able to show that one part follows from another, indicate why. Carrying out proofs is the best way to understand the material.