

MAT157 – ANALYSIS I, 2018–19. ASSIGNMENT 15.

Please read Spivak Chapters 20 (“Approximations by polynomial functions”). Clear solutions to the following problems are due in class on Thursday March 14th.

- (1) Find a reduction formula for *one* of the following two integrals:  $\int x^n e^x$ ,  $\int (\log x)^n dx$ . (Spivak Chapter 19 Question 22.)

- (2) Find the following indefinite integrals:

$$(a) \int \frac{x}{x^3 - 3x^2 + 3x - 1} dx \qquad (b) \int \frac{1}{x^2 + x + 1} dx$$

- (3) Spivak, Appendix to Chapter 19, p.405–408, Questions 4 and 12(b). (Volume and surface area of torus.)

Solve the following questions from Spivak’s book. Do not hand in your solutions.

- Chapter 19 Problem 6: one item of your choice. (Integration of rational functions.)
- Spivak, Appendix to Chapter 19, p.405–408, Questions 3, 12(a). (Volume and surface area of ellipsoid.)