

MAT157 – ANALYSIS I, 2018–19. ASSIGNMENT 7.

Please re-read Chapter 9 (“Derivatives”) of Spivak’s book, read Chapter 10 (“Differentiation”) of Spivak’s book, and read the handout “Differentiation” on the course website. Clear solutions to the following problems are due in the tutorial on Thursday November 15th.

- (1) Spivak Chapter 9 Problem 11 (motion of falling body).
- (2) Spivak Chapter 10 Problem 1 Parts (ii), (iv) and Problem 3 (differentiation involving trigonometric functions).
You may assume that $\sin' x = \cos x$ and that $\cos' x = -\sin x$. (We will prove these formulas later in the year after we formally define the sine and cosine functions.)
- (3) Spivak Chapter 10 Problem 8 (areas of concentric circles).
- (4) Spivak Chapter 10 Problem 22 (derivative of polynomials in x and $1/x$).
- (5) Spivak Chapter 10 Problem 24 (double roots).

Please solve the following questions but do not hand in your solutions.

- Spivak Chapter 9 Question 30 (Leibniz notation): for each item, identify the fact occurring in a previous problem that the item restates.
- Spivak Chapter 10 Problem 6 items (iv) and (vi) and Problem 18 (derivatives, given functional relations).
- Spivak Chapter 10 Problem 9 (particles moving along lines).
- Spivak Chapter 10 Problem 35 (Leibniz notation for chain rule).
- The questions from last week.