

# Exercises Set 3

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September 15, 2023

## Abstract

Only the questions with a \* are compulsory (but do all of them!).

## 1 Fundamental Theorem of Calculus

**Generalization** Let  $f(x)$  be a continuous function on the closed interval  $[a, b]$ , and let  $F(x)$  be an anti-derivative of  $f(x)$ . Prove that

$$\int_a^b f(x) dx = F(b) - F(a).$$

**Application** Evaluate the following definite integral using the Fundamental Theorem of Calculus:

$$\int_0^{\pi/2} \sin(x) dx$$