

**Mathematics 1, Homework 06**  
**Leipzig University, WiSe 2023/24, Tim Shilkin**  
**Due Date: 03.12.23 until 23:59 on-line**  
**or 07.12.23 until 9:15 am in person**

Each problem is estimated by one point. Explain your answers.

Compute the following antiderivatives:

1.  $\int \left(\frac{1-x}{x}\right)^2 dx =$
2.  $\int \left(1 - \frac{1}{x^2}\right) \sqrt{x} \sqrt{x} dx =$
3.  $\int \frac{dx}{e^x + e^{-x}} =$
4.  $\int \cos^5 x \cdot \sqrt{\sin x} dx =$
5.  $\int x^2 \sqrt[3]{1-x} dx =$
6.  $\int \frac{x}{\cos^2 x} dx =$
7.  $\int e^{\sqrt{x}} dx =$
8.  $\int \sqrt{1-x^2} dx =$
9.  $\int \sin x \cos(x+1) dx =$
10.  $\int \frac{2x+3}{(x-2)(x+5)} dx$