



Problem 1. [4 points] Calculate the following primitives:

a) [2 points]

$$\int \frac{1}{(x+2)^2(x+3)^2} dx$$

b) [2 points]

$$\int \frac{5x^5}{\sqrt{1-x^4}} dx \quad [\text{HINT: } x^2 = \sin t]$$

Problem 2. [2 points] Find a function $f(x)$ and a constant c such that

$$\int_c^x t f(t) dt = \sin x - x \cos x - \frac{1}{2}x^2$$

for all $x \in \mathbb{R}$.

Problem 3. [4 points] Given the functions

$$f(x) = \frac{3-x}{2} \quad \text{and} \quad g(x) = -\sqrt{x}$$

a) [2 points] Calculate the area of the region delimited by f , g and the y axis.

b) [2 points] Calculate the volume of the solid generated when the region in a) revolves around the y axis.
