Summer Term I | MA124 Calculus II
Kostadinov | Boston University

Quiz No.9

student:

Problem 1: Evaluate the definite integral

$$\int_0^1 x^2 - \sqrt{x}\, dx$$

Problem 2: Evaluate the indefinite integral

$$\int x \sin(x)\, dx$$

Problem 3: Evaluate the indefinite integral

$$\int e^x - x^2 + x - 1\, dx$$

Problem 4: Evaluate the definite integral

$$\int_0^1 e^{x-1} - x^3\, dx$$

Problem 5: Evaluate the indefinite integral

$$\int \ln(\sqrt{x})\, dx$$

Problem 6: Sketch the region bounded by the curves:

$$y = x^2 \text{ and } x = y^2$$

Label the curves and determine any points of intersection.
Then find the area of this region.

Problem 7: Sketch the region bounded by the curves:

$$y = e^x - 1, \quad y = x^2 - x, \quad x = 1;$$

Label the curves and determine any points of intersection.
Then find the area of this region.

Problem 8: Find the volume of the solid obtained by rotating the region bounded by $y = x^3$, $y = 8$, and $x = 0$ about the y-axis.

Problem 9: Find the arc length of the curve:

$$y = \frac{x^3}{6} + \frac{1}{2x}, \quad \frac{1}{2} \leq x \leq 1.$$

Problem 10: Find the arc length of the curve:

$$x = e^t + e^{-t}, y = 5 - 2t, \quad 0 \leq t \leq 3.$$