

MATH 20C: FUNDAMENTALS OF CALCULUS II
WORKSHEET, DAY #21 (EXAM #2 REVIEW)

Problem 1. Evaluate the integral

$$\int_0^1 (x^2 + 2)e^x dx.$$

Problem 2. Evaluate the integral

$$\int \frac{\sin(\ln x)}{x} dx.$$

Problem 3. Find the area between $y = \sin x$ and $y = -x$ for x in $[0, \pi]$.

Problem 4. Find the average value of $f(x) = (x + 1) \ln x$ over $[1, 2e]$.

Problem 5. Determine if the following given improper integral converges or diverges. If it converges, calculate its value.

$$\int_1^{\infty} \frac{1}{\sqrt{x}} dx.$$

Problem 6. Solve the differential equation

$$xy \frac{dy}{dx} = 1$$

with $y(1) = 1$.