

Math 231/199
Mock Exam 1

(1) Find

$$\int e^x \cos(x) dx.$$

(2) Find

$$\int \frac{2x + 1}{9 - x^2} dx.$$

(3) Find

$$\int \sin^3(x) \cos^{12}(x) dx.$$

(4) Solve the differential equation $y'(x) = 2y(x) + 6$ with initial condition $y(0) = 12$.

(5) Determine if

$$\int_3^{\infty} \frac{4 - \sin(x)}{x} dx$$

converges, and find its value if it does.

(6) Find

$$\int \frac{2x^4 - 2x^3 + 9x^2 - 5x - 2}{(x - 1)(x^2 + 1)} dx.$$