

MATH 141, FALL 2009, SAMPLE MIDTERM 2

1) Solve the differential equation

$$\frac{dy}{dx} = \frac{1}{1-x}y + \cos(x).$$

2) Evaluate the integral

$$\int x^7 e^{x^4} dx.$$

3) Compute

$$\int \frac{2}{x^2 \sqrt{4-x^2}} dx.$$

4) Compute

$$\int \sin^2(x) \cos^3(x) \sec^2(x) dx.$$

[NO PARTIAL CREDIT]

5) Determine whether the improper integral $\int_{-5}^2 \frac{2x+3}{x^2+3x-10} dx$ diverges or converges. If it converges, determine its value; if it diverges, give the reason.