MATH 1B_MIDTERM 1_FALL 2002_NELA

Name: _____

Mathematics 1B, Midterm 1, Professor Wappa

1. Evaluate the indefinite integral $\int \frac{\ln x}{\sqrt{x}}\, dx$ for $x > 0$.

2. Evaluate $\int_0^{\pi} \sin^3 x \, dx$ and $\int_0^{\pi} \sin^4 x \, dx$.

3. Evaluate the indefinite integral $\int \frac{x^2}{\sqrt{1-x^2}}\,dx$ for $-1 < x < 1$.

4. Evaluate the indefinite integral $\int \frac{dx}{x(1-x)^2}$ for $0 < x < 1$.

5. Which of the improper integrals below *diverges*? Evaluate the *convergent* integrals.

a) $\int_0^1 \frac{dx}{(1-x)^3}$ b) $\int_1^\infty \frac{dx}{(1+x^3)^{1/3}}$ c) $\int_{-1}^1 \frac{dx}{\sqrt{1-x^2}}$

d) $\int_0^\infty \cos x \, dx$