

MATH 5B - TEST 2
Sample

(Chapter 7)

100 POINTS

NAME: _____

**** NO NOTES - NO CALCULATORS****

Find the value of the following improper integrals. Be sure to use all appropriate notation.

(1) $\int_0^4 \frac{1}{(x-2)^3} dx$

(2) $\int_1^{\infty} \frac{1}{\sqrt{x}(x+4)} dx$

- (3) (a) Use Simpson's Rule with $n=10$ to approximate the area under the curve $y = e^{-x^2}$, $0 \leq x \leq 1$.
* Use your calculator efficiently to prevent round-off error.
(b) Estimate the error involved in the above approximation.
(c) If you want to guarantee that the Simpson's Rule approximation is accurate to within 0.00001, how large must n be?

FOR PROBLEMS 5 - 13, INTEGRATE AND SIMPLIFY

(5) $\int \sin^{3/2} x \cos^3 x \, dx$

$$(6) \int \frac{4x+1}{2x^2+x-10} dx$$

$$(7) \int \sqrt{x} \ln x dx$$

$$(8) \int \frac{1}{1 + \sqrt[3]{x}} dx$$

$$(9) \int \frac{dx}{x^2 \sqrt{x^2 - 16}}$$

$$(10) \int x^2 \cos(3x) dx$$

$$(11) \int \frac{x}{\sqrt{3-2x-x^2}} dx$$

$$(12) \int \frac{5x^3 - 3x^2 + 7x - 3}{(x^2 + 1)^2} dx$$

(13) The region under the curve $y = \cos^2 x$, $0 \leq x \leq \frac{\pi}{2}$, is rotated about the y axis. Find the volume of the resulting solid.