

Mini-test for Ch 8.7, 8.8

Math 104, Spring 2009

You must show your work. No credit is given if no supporting work is shown. No partial credit is given.

1. Integrate

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

- A.) 0 B.) 1 C.) 2 D.) $\frac{1}{2}\pi$ E.) $-1 + \frac{1}{2}\pi$ F.) The integral diverges

2. Integrate

$$\int_e^{\infty} \frac{\ln x}{x^2} dx.$$

- A.) 0 B.) 1 C.) e D.) $e - \frac{1}{e}$ E.) $\frac{2}{e}$ F.) The integral diverges

3. We know that

$$\int_0^1 \frac{4}{x^2 + 1} dx = 4 \tan^{-1} x \Big|_0^1 = 4 \left(\frac{\pi}{4} - 0 \right) = \pi.$$

You can use this to calculate the value of the number π . Use *Simpson's Rule* with $n = 4$ to find an approximate value for the integral (i.e., compute S_4). Use a calculator.

If you know that the first eight digits of π are

$$\pi = 3.1415926\dots$$

then how many of these digits are correct in your approximation? (Example: if you found that $S_4 = 3.1427\dots$, then you would have 3 correct digits of π .)

A.) 3 B.) 4 C.) 5 D.) 6 E.) 7 F.) 8