

**Multiple choice questions for sections 8.7, 8.8**

*Math 104, Spring 08*

Show your work. No partial credit is given, but a correct guess without supporting work also receives no credit.

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. Using a standard integral we find that

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

With the help of this integral you can find approximations for the number  $\pi$ . 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  $\pi$  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  $\pi$ .)

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