

NAME:

MAC2312/Quiz-7

READ ME FIRST: Show me all the magic very neatly on the page, for I do not read minds. Use correct notation when presenting your computations and arguments. Use complete sentences. Remember this: "=" denotes "equals", " \Rightarrow " denotes "implies", and " \Leftrightarrow " denotes "is equivalent to". Since the answer consists of all the magic transformations, do not "box" your final results. Eschew obfuscation.

1. (4 pts.) Consider the definite integral below. Write down the sum, S_4 , used to approximate the value of the integral below if Simpson's Rule is used with $n = 4$. Do not attempt to evaluate the sum. Be very careful.

$$\int_1^3 x^{1/2} dx$$

$$S_4 =$$

2. (4 pts.) Make an appropriate u-substitution of the form $u = x^{1/n}$ or $u = (x + a)^{1/n}$ and then evaluate the integral.

$$\int \frac{dx}{x - x^{1/3}} =$$

3. (4 pts.) Evaluate the following integral using the substitution $u = \tan(x/2)$.

$$\int \frac{1}{1 - \cos(x)} dx =$$

4. (8 pts.) Evaluate the integrals that converge.

(a) $\int_e^{+\infty} \frac{1}{x \ln^3(x)} dx =$

(b) $\int_0^1 \frac{1}{(1-x^2)^{1/2}} dx =$