

Quiz #3

M1220-1

Fall 2003

Name: _____

Score: _____

QUESTIONS: each question is worth 20 points. Give your answer and a short but complete motivation of it for full credit.

1. TRUE or FALSE?

$$\sinh(2x) = 2 \sinh(x) \cosh(x).$$

2. What is the useful substitution in computing the following integral?

$$\int \frac{\sin(mx)}{1 + \cos^2(mx)} dx$$

- (a) $u = \sin(mx)$;
- (b) $u = \cos(mx)$;
- (c) $u = 1 + \cos^2(mx)$;
- (d) $u = \cos^2(mx)$.

3. Evaluate the following integral. (Show work or motivation for your answer!!!)

$$\int_{-23.7}^{23.7} \frac{\sin(3x) \tan(5x^3) \cos^4(x)}{\sqrt{x^4 + x^2 + 1} \sinh(x)} dx.$$

4. Write, next to each integral, the “type” of answer it has. I don’t want to know the exact answer, I only want to know if it involves logarithms, arctangents, or if it is just another rational function.

(a)

$$\int \frac{dx}{x^2 + 4x - 6};$$

(b)

$$\int \frac{dx}{x^2 + 8x + 16};$$

(c)

$$\int \frac{dx}{x^2 + x + 6};$$

(d)

$$\int \frac{x dx}{(x^2 + 1)^3}.$$

PROBLEM: the problem is worth 20 points. Show me enough work to let me know what you are doing!

1. Compute the following definite integral:

$$\int_0^{\frac{\pi}{3}} \frac{e^{\sqrt{\cos(t)}} \sin(t)}{\sqrt{\cos(t)}} dt.$$