Group Exam 2

Calculus II
Professor Johnson
Fall 2008

Name: _____
Name of group member: _____
Name of group member: _____

Problem 1: This problem consists of two unrelated parts; part A and part B.

A. Which of the following areas are equal? How do you know?

B. Three students were given the following problem:

Unfortunately, we cannot make out the actual question. However, we know that Student 1's answer is $\sin^2(x) + C$, Student 2's answer is $-\cos^2(x) + C$, and Student 3's answer is $-\sin^2(x) + C$. Two of these students got the question right. One of them got it wrong. What was the original question and who got it wrong?

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Problem 2: Let $f(x) = \int_0^x \frac{1-t}{t^4+2} dt$. Determine if the following statements are TRUE or FALSE. Justify your answers; unsupported answers will receive no credit.

(a) $f(0) = 0$

(b) $f(1) > 0$

(c) $f(-1) > 0$

(d) f is always increasing for $x \geq 0$.

(e) f has a local maximum at $x = 1$

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Problem 3: This problem consists of two unrelated parts, part A and part B.

A. Evaluate $\int_0^{2\pi} \cos^2(x)\sin(x)dx$.

Evaluate $\int_0^{2\pi} |\cos^2(x)\sin(x)|dx$.

B. Below is the graph of a hot air balloon's vertical velocity v as a function of time t for $0 \leq t \leq 7$ *hours*. Did the balloon ever drop below it starting height during this time? Justify your answer.