Math 132: Discussion Session: Week 4

Directions: In groups of 3-4 students, work the problems on the following page. Below, list the members of your group and your answers to the specified questions. Turn **this paper** in at the end of class. You do not need to turn in the question page or your work.

Additional Instructions: It is okay if you do not completely finish all of the problems. Also, each group member should work through each problem, as similar problems may appear on the exam.

Scoring:

Correct answers	Grade
0–3	0%
4–6	80%
7–11	100%

Group Members:

5.5: The Substitution Rule.

(1) (a) $\displaystyle\int_0^3 x\sqrt{x^2+16}\,dx =$

(b) $\displaystyle\int (\cot x)\ln(\sin x)\,dx =$

(c) $\displaystyle\int \cot x\,dx =$

(d) $\displaystyle\int \frac{dx}{(1+\sqrt{x})^5} =$

(2) a and b equal:

6.1: Area between curves.

(1) The area is:

(2) The area is:

(3) The area is:

(4) The area is:

(5) The area is:

(6) The area is:

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5.5: The Substitution Rule.

(1) Compute the following integrals using the substitution rule:

(a) $\displaystyle\int_0^3 x\sqrt{x^2+16}\ dx$

(b) $\displaystyle\int (\cot x)\ln(\sin x)\ dx$

(c) $\displaystyle\int \cot x\ dx$

(d) $\displaystyle\int \frac{dx}{(1+\sqrt{x})^5}$

(2) Find numbers a and b such that

$$\int_a^b (u^2+1)\ du = \int_{-\pi/4}^{\pi/4} \sec^4\theta\ d\theta.$$

Hint: $\sec^2\theta = \tan^2\theta + 1$, so

$$\sec^4\theta\ d\theta = \left(\tan^2\theta+1\right)\left(\sec^2\theta\ d\theta\right).$$

6.1: Areas between Curves. Compute the areas of the regions bounded by the following curves:

(1) $y = e^x$, $y = e^{-x}$, $y = 3$

(2) $y = \cos x$, $y = \cos(2x)$, $x = 0$, $x = \frac{2\pi}{3}$

(3) $y = |x|$, $y = 2 - |x|$

(4) $x + y = 4$, $x - y = 0$, $3x + y = 4$

(5) $x = \sin y$ and $x = 1 - \cos y$, for $0 \le y \le \pi$

(6) $x = y^3 - 4y$, $x + 3y = 0$