Math 132: Discussion Session: Week 6

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:

6.3: The cylindrical shell method.

(1) The volume is:

(2) The volume is:

6.5: Average Value.

(1) The average value is:

(2) The average value is:

7.1: Integration by Parts.

(1) $\displaystyle\int_0^1 xe^x\,dx =$

(2) $\displaystyle\int x^3 \ln x\,dx =$

(3) $\displaystyle\int \ln\sqrt{x}\,dx =$

(4) $\displaystyle\int (\ln x)^2\,dx =$

(5) $\displaystyle\int_{-\pi/3}^{\pi/3} x^4 \sin x\,dx =$

(6) $\displaystyle\int_0^{\pi} e^x \sin x\,dx =$

(7) $\displaystyle\int e^{\sqrt[3]{x}}\,dx =$

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6.3: The cylindrical shell method. Using the cylindrical shell method, find the volume of the solid obtained by rotating the region enclosed by the given curves about the given axis.

(1) $y = a - x$ with $a > 0$, $x = 0$, $y = 0$, about $x = -1$. Your answer should be in terms of a.

(2) $x = y(4 - y)$, $x = 0$, about the x-axis

6.5: Average Value.

(1) Compute the average value of $f(x) = 2x^3 - 9x^2$ on $[-1, 3]$.

(2) Compute the average value of $g(x) = e^{nx}$ on $[-1, 1]$. (Your answer will be in terms of n.)

7.1: Integration by Parts. Compute the following integrals using integration by parts:

(1) $\displaystyle\int_0^1 xe^x \, dx$

(2) $\displaystyle\int x^3 \ln x \, dx$

(3) $\displaystyle\int \ln \sqrt{x} \, dx$

(4) $\displaystyle\int (\ln x)^2 \, dx$.

(5) $\displaystyle\int_{-\pi/3}^{\pi/3} x^4 \sin x \, dx$. Hint: There's a much faster way to do this problem than integration by parts.

(6) $\displaystyle\int_0^{\pi} e^x \sin x \, dx$. Hint: Boldly integrate by parts twice. Then, solve an equation for $\int e^x \sin x \, dx$.

(7) $\displaystyle\int e^{\sqrt[3]{x}} \, dx$. Hint: First do the substitution $u = \sqrt[3]{x}$.