Math 132: Discussion Session: Week 5

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, but you should solve most of the problems. Also, each group member should work through each problem, as similar problems may appear on the exam.

Group Members

Group Answers

6.3: Shell Method

1. a. The volume is:

   b. The volume is:

   c. The volume is:

   d. The volume is:

6.5: Average Value

1. The average value is:

2. The average value is

7.1: Integration by Parts

1. a. The integral equals

   b. The integral equals

   c. The integral equals

   d. The integral equals

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6.3: The Shell Method

1. Using the Shell Method, find the volume of the solid obtained by rotating the region enclosed by the given curves about the given axis.

   a. $y = x^2$, $y = 8 - x^2$, $x = 0$, for $x \geq 0$, about the y-axis

   b. $y = (x^2 + 1)^{-2}$, $y = 2 - (x^2 + 1)^{-2}$, $x = 2$, about the y-axis

   c. $y = a - x$, with $a > 0$, $x = 0$, $x = a$, about $x = -1$

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

6.5: Average Value

1. Compute the average value of $f(x) = 2x^3 - 6x^2$ on $[-1, 3]$.

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

7.1: Integration by Parts

1. Compute the following integrals using integration by parts:

   a. $\displaystyle\int_0^1 x3^x \, dx$

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

   c. $\displaystyle\int_0^\pi e^x \sin x \, dx$

   d. $\displaystyle\int e^{\sqrt{x}} \, dx$ (Hint: first do a u-substitution with $u = \sqrt{x}$.)