Math 102, Fall 2021 — Homework 10

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Due November 17 at 5:00 pm

Instructions. This homework, like most others this semester, has two parts. One part is on Webwork, and the other part is some problems that you will write solutions to by hand and submit on Gradescope.

Webwork

No webwork this week.

Written problems

Write up solutions to the following problems, making sure to show your work, write neatly, scan clearly, and generally follow the guidelines for writing good homework solutions. You should submit solutions on Gradescope.

Problem 1. For each of the regions described below, set up an integral for finding the volume of the solid that is formed by revolving the region around the x-axis. Please use discs or washers. You do not need to compute the integral.

1. The region between $y = -x^2 + 6x$ and the x-axis for values of x between 0 and 6.
2. The region between $y = \cos x$ and the x-axis for values of x between 0 and 2π.
3. The region between $y = (x+1)^2$ and the line $y = 1$ for values of x between 1 and 2.
4. The region between $y = e^{3x}$ and $y = e^x$ for values of x between 0 and 1.

Problem 2. Consider the bounded region between $y = x^2$ and $y = 5x$. Set up an integral for finding the volume of the solid that is formed by revolving the region around each of the following axes. Please use discs or washers. You do not need to compute the integral.

1. The x-axis.
2. The y-axis.
3. The line $y = -4$.
4. The line $x = -3$.

Problem 3. Consider the region between $y = e^x$ and $y = 0$ for values of x between 0 and 1. Set up an integral for finding the volume of the solid that is formed by revolving the region around each of the following axes. Please use shells. You do not need to compute the integral.

1. The y-axis.
2. The line $x = 1$.
3. The line $x = -1$.
4. The x-axis.