MATH 21B DISCUSSION WORKSHEET 4

Problem 1. Find the volume of the solid generated by revolving the region in the first quadrant bounded by $y = \sqrt[3]{x}$, $x = 8$, and the x-axis about the x-axis ...

(a) ... by using the disc method.

(b) ... by using the shell method.

Problem 2. Find the volume of the solid generated by revolving the region bounded by $x + 2y = y^2 + 4$, $y = 2$, the x-axis, and the line $x = 1$ about the y-axis.

[Something to think about: Which method (disc, washer, or shell) is best for this question? Why? Also, observe that Problem 1 was well-suited to more than one method, but this problem is best-suited to one particular method. (Why?)]

Problem 3. Find the volume of the solid generated by revolving the region bounded by $y = \frac{2x+5}{\sqrt{x-3}}$, $x = 4$, $x = 7$, and the x-axis about the line $x = -3$.

Problem 4. Set up (but do not compute) a definite integral describing the volume of the solid generated by revolving the region bounded by $(x-3)^2+y^2 = 4$ about the y-axis. [Bonus challenge: Compute the integral.]

Problem 5. Let R be the region bounded by the curves $y = x^2$ and $y = x$. Using any method you like, compute the volumes of the following solids:

(a) The solid generated by revolving R about the x-axis.

(b) The solid generated by revolving R about the line $x = -1$.

(c) (Evil challenge problem beyond the scope of this course) The solid generated by revolving R about the line $y = x$.