Math 141 Sections 5.6 and 6.2 Study Guide

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1 Section 5.6

Problem 1) Find the area of the region bounded by $y = (1 - \cos(x))\sin(x)$ and the x-axis.

Problem 2) Find the area of the region bounded by $y = \cos^2(x), y = 1, x = 0$, and $x = \pi$.

Problem 3) Find the area of the region bounded by $y = x^2$, $y = 2 - x$, and the x-axis.

Problem 4) Find the area of the region bounded by $y = \sin(x), y = \cos(x)$, the y-axis, and $x = \pi/2$.

2 Section 6.2

Problem 5) Determine the integral for the following solids. You may either use the disk (washer) method or the cylinder (shell) method. You need only set up the integral correctly, and not evaluate it. Show all work for setting up the integral and obtaining the bounds.

(a) Consider the region bounded by $y = 7 - x^2, x = -2, x = 2$, and the x-axis. Suppose this region is rotated about the x-axis.

(b) Consider the region bounded by $x = y^2 - 6x + 10$ and $x = 5$. Suppose this region is rotated about the y-axis. [**Note:** For the purposes of sketching $x = y^2 - 6x + 10$, it may be helpful to rotate your paper and treat the y-axis as the x-axis. Please ask if this is not clear.]

(c) Consider the region bounded by $x = y^2 - 4$ and $x = 6 - 3y$. Suppose this region is rotated about the line $x = 24$.

(d) Consider the region bounded by $y = \sqrt{2x - 1}$ and $y = x - 1$. Suppose this region is rotated about the line $x = 6$.