

Math 104-004, Homework 4

Due in recitation on Monday February 25 and Wednesday February 27

Please show work, print this sheet, and attach it to the solutions.

Name: _____ Section: _____

Reading Thomas §6 (pages)

Problems

0 Fall 2008-14 Compute the integral $\int \frac{x^3}{\sqrt{1-x^2}} dx$

1 Fall 2011 2 Find the length of the arc of the curve defined by $y = \frac{1}{3}\sqrt{x^3}$ for $0 \leq x \leq 3$

(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) 4 (d) $5 \ln 3$ (e) $\frac{14}{3}$ (f) $\frac{1}{4}$ (g) $\frac{e}{8}$ (h) $\frac{\ln 3}{2}$

2 Fall 2011 3 Find the volume obtained by rotating the region between the graph of $y = \frac{1}{2} \sin^2(x^2)$ and the x-axis for $0 \leq x \leq \sqrt{\pi}$ about the y-axis.

(a) $\frac{\pi}{2}$ (b) $\frac{\pi^2}{4}$ (c) $\frac{5}{4}$ (d) $\frac{3\pi^2}{4}$ (e) $\frac{1}{2}$ (f) $\frac{1}{4}$ (g) $\frac{\pi}{8}$ (h) $\frac{\pi^2}{8}$

3 Fall 2010 1 Find the area bounded by the y-axis, the graph of $y = e^x$ and the graph of $y = xe^x$. (a) 1 (b) 2 (c) $e - 2$ (d) e (e) $e + 2$ (f) $2e$ (g) $e^2 - e$ (h) $3e - 2$

4 Fall 2010 3 Find the volume of the solid obtained by rotating the region bounded by the x-axis, the line $y = 1$, the curve $y = \ln(x)$, and the line $x = 1/2$ about the y-axis.

5 Fall 2009 1 Find the area of the region between the curves $x = 4 - y^2$ and $x = -3y$.

6 Fall 2008 2 The volume of the solid generated by revolving the region bounded by the curves $x = y^2$ and $y = x - 2$ about the y-axis.

7 Fall 2008 3 Find the volume of the solid generated by rotating about the y-axis the region enclosed by $y = \sin x$ and the x-axis from $x = 0$ to $x = \pi$.