Math 104 Fall 2008
Make Up Midterm Exam 1

Name: _____

Student Number: _____

TA: _____ Section: _____

Write all answers (A, B, C, D, E, F) in the spaces provided below!

1. _____	6. _____
2. _____	7. _____
3. _____	8. _____
4. _____	9. _____
5. _____	10. _____

1. No calculators, computers, mobile phones are permitted.

2. Only one piece of letter size paper (8.5 in. by 11 in.) is permitted, with writing on both sides allowed.

3. No partial credit will be given.

1. The region enclosed by the circle

$$x^2 + y^2 = 12$$

and the straight lines $y = 0$, $x = 1$ and $x = 3$ is rotated about the x-axis. Find the volume of the resulting solid of revolution.

A.) $\frac{32}{3}\pi$

B.) $\frac{36}{5}\pi$

C.) $\frac{46}{3}\pi$

D.) $\frac{38}{3}\pi$

E.) $\frac{40}{3}\pi$

F.) 14π

2. What is the (positive) area of the bounded region enclosed by the curves $y = x^5$ and $x = y^5$?

A.) 2

B.) $\frac{4}{3}$

C.) 1

D.) $\frac{3}{4}$

E.) $\frac{1}{2}$

F.) $\frac{1}{4}$

3. What is the (positive) area of the bounded region enclosed by the curves $y = 6\ln(x)$ and $y = 2x\ln(x)$?

A.) $2\ln(2)$

B.) $\frac{5}{2}$

C.) $9\ln(3) - 8$

D.) $4\ln(2)$

E.) $4\ln(5) - \frac{5}{2}$

F.) $9\ln(2) - 9$

4. The region enclosed by the hyperbola

$$y = \frac{1}{x}$$

and the straight lines $x = 0$, $y = 1$, and $y = 2$ is rotated about the axis $x = -1$. Find the volume of the resulting solid of revolution.

A.) $(\frac{1}{2} + 2\ln 2)\pi$

B.) $(2 + \frac{1}{2}\ln 2)\pi$

C.) $(\frac{1}{3} + 3\ln 2)\pi$

D.) $(3 + \frac{1}{3}\ln 2)\pi$

E.) $(\frac{1}{4} + 4\ln 2)\pi$

F.) $(4 + \frac{1}{4}\ln 2)\pi$

5. What is $\int_0^{\frac{\pi}{2}} e^{3x}\sin(x)dx$?

A.) $\left(e^{\frac{3\pi}{2}}+1\right)$

B.) $-\frac{1}{5}\left(e^{\frac{3\pi}{2}}-1\right)$

C.) 0

D.) $-\frac{1}{10}\left(e^{\frac{3\pi}{2}}+1\right)$

E.) $e^{\frac{3\pi}{2}}$

F.) $\frac{1}{12}\left(e^{\frac{3\pi}{2}}-2\right)$

6. The area under the curve $y = sin(x)$ from $x = 0$ to $x = \pi/2$ is rotated about the x-axis. What is the volume?

A.) $\frac{1}{2}\pi^2$

B.) $\frac{1}{4}\pi^2$

C.) $\frac{2}{3}\pi^2$

D.) $\frac{1}{2}\pi^2 - 1$

E.) $\frac{1}{2}(\pi^2 - 1)$

F.) $2\pi^2 - 2$

7. What is the average of the function $f(x) = xe^{-2x}$ on the interval $\left[-\frac{1}{2}, 0\right]$?

A.) $-\frac{1}{16}$

B.) 0

C.) -1

D.) $\frac{1}{9}$

E.) $-\frac{1}{4}$

F.) $-\frac{1}{2}$

8.

$$\int_0^{\sqrt{\pi/4}} 6x \sin^3(x^2) \cos^3(x^2) dx$$

A.) 7/6

B.) 1/8

C.) 3/2

D.) 7/2

E.) π

F.) 2

9. The region enclosed by the parabola

$$y = 2 + x - x^2$$

and the straight line $x+y = 2$ is rotated about the y-axis. Find the volume of the resulting solid of revolution.

A.) $\frac{8}{3}\pi$

B.) 3π

C.) $\frac{10}{3}\pi$

D.) $\frac{2}{3}\pi$

E.) $\frac{3}{4}\pi$

F.) $\frac{5}{6}\pi$

10. The region enclosed by the two curves

$$x = y^4, \text{ and } y = x^4$$

is rotated about the axis $x = 3$. Find the volume of the resulting solid of revolution.

A.) $\frac{19}{33}\pi$

B.) $\frac{29}{30}\pi$

C.) π

D.) $\frac{31}{30}\pi$

E.) $\frac{16}{15}\pi$

F.) $\frac{11}{10}\pi$