Math 104
Practice Midterm Exam 1

Name _____

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

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

Score: _____ (100 points possible)

1. The testing booklet contains 10 questions.

2. No calculators are permitted.

3. One piece of paper (8.5 in. by 11 in.) is permitted, with writing on both sides allowed.

4. There is no penalty for guessing. But correct answers without supporting work may receive no credit.

5. No partial credit will be given.

6. Write all calculations on the pages provided. Extra pages are available if needed.

1. Find the value of c so that the line $y = c$ divides the region bounded by the curves

$$y = x^2 \qquad \text{and} \qquad y = 4$$

into two regions of equal area.

A.) $1/2$ B.) 1 C.) $2^{1/3}$ D.) $2^{2/3}$ E.) 2 F.) $2^{4/3}$

2. Find the volume of the solid of revolution obtained by rotating the region enclosed by the graphs of

$$y = x^{1/3}\,, \qquad y = 0\,, \qquad x = 1,$$

about the line $x = 2$.

A.) $3\pi/14$ B.) $9\pi/14$ C.) $\pi/7$ D.) $5\pi/7$ E.) $6\pi/7$ F.) $15\pi/7$

3. Find the volume of the solid of revolution obtained by rotating the region enclosed by the graphs of

$$y = \sqrt{x^3}\,, \qquad y = 1\,, \qquad x = 0\,,$$

about the line $y = 1$.

A.) $5\pi/16$ B.) $6\pi/17$ C.) $7\pi/18$ D.) $8\pi/19$ E.) $9\pi/20$ F.) $10\pi/21$

4. Find the volume of the solid of revolution obtained by rotating the region enclosed by the graphs of

$$y = x - 2 \qquad \text{and} \qquad x = 4 - y^2$$

about the y-axis.

A.) $27\pi/5$ B.) $54\pi/5$ C.) $81\pi/5$ D.) $108\pi/5$ E.) $135\pi/5$ F.) $162\pi/5$

5. Evaluate the integral.

$$\int_0^2 \frac{x^2}{\sqrt{x^3+1}}\,dx$$

A.) 8/9 B.) 4/3 C.) 52/9 D.) $\frac{2\sqrt{2}}{3}$ E.) $\frac{4\sqrt{2}}{9}$ F.) $\sqrt{5}-1$

6. Integrate:

$$\int_0^{\frac{1}{2}\ln(3)} \frac{e^x}{1+e^{2x}}\,dx$$

A.) $\pi/3$ B.) $\frac{\sqrt{3}}{4(1+\sqrt{3})^2}$ C.) $\frac{\sqrt{3}}{3}-1$ D.) $\arcsin(\sqrt{3})-\frac{\pi}{2}$ E.) $\pi/12$ F.) $\sqrt{3}-1$

7. Integrate:

$$\int_0^1 \frac{t^3}{\sqrt{16-4t^8}}\,dt$$

A.) $\pi/48$ B.) $\pi/24$ C.) $\pi/16$ D.) $\pi/12$ E.) $\pi/8$ F.) $\pi/4$

8. Evaluate the integral.

$$\int_3^4 \sqrt{-x^2+6x-8}\,dx$$

A.) 0 B.) $\pi/6$ C.) $\pi/4$ D.) $\pi/3$ E.) $\pi/2$ F.) π

9. Evaluate the integral.

$$\int_0^1 \frac{x^2-1}{x^2+1}\,dx$$

A.) 0 B.) 1 C.) $1-\frac{\pi}{2}$ D.) $-1/2$ E.) $1+\frac{\pi}{4}$ F.) $1/4$

10. Evaluate the integral.

$$\int_0^{\pi/6} \frac{\tan^4(2x)}{\cos^2(2x)}\,dx$$

A.) $\frac{9\sqrt{3}}{10}$ B.) $\frac{9\sqrt{3}}{16} - \frac{\pi}{4}$ C.) $\frac{\sqrt{3}}{270}$ D.) $-\frac{9\sqrt{3}}{128} + \frac{\pi}{16}$ E.) $\frac{\sqrt{3}}{2} - \frac{\pi}{6}$ F.) $-\frac{\sqrt{3}}{16} + \frac{\pi}{12}$