MAC 2312 CALCULUS II CRN 83557 MWF

Exam 1

Term `Fall, 2024`

Full Name:

Instructions

1. Total time: **1 hour 15 minutes**.
2. Write the information requested above.
3. Switch off any electronic devices.
4. Calculators are not allowed.
5. Write the solution in the given space.
6. Show all your work for full credit.
7. Scratch papers are provided but will not be graded.

Q.N.	Points	Score
1	10	
2	10	
3	10	
4	10	
5	10	
6	10	
Bonus	10	
Total	60	

1. (10 points) Find the area of the region bounded by the curves (integrate with respect to x):

$$y = x^2 + 2x, \qquad y = 4x$$

2. (10 points) (Disk Problem) Find the volume of the solid obtained by rotating the region bounded by

$$y = \sqrt{x+2},\ x = -1,\ x = 1; \qquad \text{about the } x\text{-axis.}$$

3. (10 points) Find the integral using Integration by Parts: $\int_0^{\frac{\pi}{2}} x \sin x \, dx$

4. (10 points) Find the integral using trigonometric substitution $\int \frac{x}{\sqrt{(4-x^2)}}\,dx$.
   (Hint: Substitute $x = 2\sin\theta$, find dx then integrate)

5. (10 points) Find the integral using partial fraction $\int \frac{1}{(x^2 - 3x)}\, dx$.

6. (10 points)

(a) Find the average value of the function on the given interval: $f(x) = 2x - 1, \quad [0, 2]$

(b) Find c in the given interval such that $f_{avg} = f(c)$.

Bonus Problem (Extra 10 points) Find the volume of the solid obtained by rotating the region bounded by

$$y = x^2,\ y = \sqrt{x}\ ; \quad \text{about the } y\text{-axis.}$$