



**Math 102
Final Exam**

June 8, 2005

Name:

AUB ID #:

Section 1: 8MWF, 9:30Tu

Section 2: 8MWF, 11Tu

Section 3: 9MWF, 12:30Th

Section 4: 9MWF, 9:30Th

Section 5: 9MWF, 11Th

Time: 120 minutes

INSTRUCTIONS

1. Write down your name and ID number.
2. Circle the section in which you are registered.
3. Solve the problems on the white sheets at the appropriate place. **You may use the back of each of the white sheets to complete the solution. Use the booklet for scratch work only.**
4. **Use of calculators is absolutely forbidden.**

Problem 1	/10
Problem 2	/10
Problem 3	/10
Problem 4	/10
Problem 5	/10
Problem 6	/10
Problem 7	/10
Problem 8	/10
Problem 9	/10
Total	/90

1. Use vector methods to find in radians the measures of the angles between the diagonals of the quadrilateral whose vertices are

$$A = (1, -1), B = (2, 4), C = (4, 3) \text{ and } D = (3, -2).$$

2. Evaluate the improper integral $\int_{-\infty}^{\infty} \frac{dx}{1+4x^2}$.

3. Test the integral $\int_x^{\infty} \frac{2 + \cos x}{x} dx$ for convergence.

4. Find the volume of the solid generated by revolving about the Y -axis the region in the X - Y plane bounded from above by the curve $y = \sqrt{x^2 + 1}$, from below by the X -axis, from the left by the Y -axis and from the right by the line $x = \sqrt{3}$.

5. Find the length of the curve given by $x = \frac{y^3}{6} + \frac{1}{2y}$, $2 \leq y \leq 3$.

6. Evaluate $\lim_{x \rightarrow 0} \frac{\cos x - 1}{e^x - x - 1}$

7. Evaluate $\lim_{x \rightarrow 1^+} x^{1/(1-x)}$

8. Find the area of the region in the first quadrant that is enclosed by the coordinate axes and the curve $y = \frac{\sqrt{9-x^2}}{3}$

9. Evaluate $\int \frac{dx}{\sqrt{4x^2 - 25}}$