

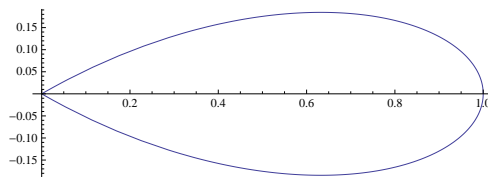


University of California, San Diego
Department of Mathematics

Instructions

1. Write your *Name*, *PID*, *Section*, and the *Version* of your exam on the front of your Blue Book.
2. No calculators or other electronic devices are allowed during this exam.
3. You may use one page of notes, but no books or other assistance during this exam.
4. Read each question carefully, and answer each question completely.
5. Write your solutions clearly in your Blue Book
 - (a) Carefully indicate the number and letter of each question.
 - (b) Present your answers in the same order they appear in the exam.
 - (c) Start each question on a new page.
6. Show all of your work; no credit will be given for unsupported answers.

1. (10 points) Find the area of the polar curve $r = \cos(3\theta)$ for $-\frac{\pi}{6} \leq \theta \leq \frac{\pi}{6}$.



2. (10 points) Evaluate the indefinite integral. You may leave your answer in exponential form.

$$\int \sin(3x) \cos(x) dx$$

3. (10 points) Evaluate the indefinite integral using the method of partial fractions.

$$\int \frac{x}{(x-1)^2(x^2+1)} dx$$

4. (10 points) Evaluate the indefinite integral.

$$\int \frac{1}{(9-x^2)^{3/2}} dx$$

5. (10 points) Evaluate the following improper integral:

$$\int_e^\infty \frac{1}{x(\ln x)^2} dx.$$

(This exam is worth 50 points.)