

Name: _____ PID: _____

TA: _____ Sec. No: _____ Sec. Time: _____

Math 20B.
Midterm Exam 2
February 27, 2008

Turn off and put away your cell phone.

No calculators or any other devices are allowed on this exam.

You may use one page of notes, but no books or other assistance on this exam.

Read each question carefully, answer each question completely, and show all of your work.

Write your solutions clearly and legibly; no credit will be given for illegible solutions.

If any question is not clear, ask for clarification.

1. (4 points) Find the 3 cube roots of $-8i$. You may leave the result in polar form.

#	Points	Score
1	4	
2	4	
3	8	
4	8	
Σ	24	

2. (4 points) Does the improper integral

$$\int_0^1 \frac{1}{x^4 + 2\sqrt{x}} dx$$

converge or diverge? You do *not* need to evaluate the integral; however, you *must* provide a correct reason to earn credit.

3. (a) (4 points) Find the partial fraction expansion (PFE) for $\frac{3x^2 - 9x + 13}{(x - 3)(x^2 + 4)}$.

(b) (4 points) Use your PFE found in part (a) to evaluate $\int \frac{3x^2 - 9x + 13}{(x - 3)(x^2 + 4)} dx$.

4. (a) (2 points) Derive the integration formula $\int x e^{ax} dx = \frac{x e^{ax}}{a} - \frac{e^{ax}}{a^2} + C$ using integration by parts. Be sure to show your work.

- (b) (6 points) The formula verified in part (a) is also valid when the constant a is a complex number. Use this fact to evaluate

$$\int x e^{2x} \cos(2x) dx$$

using complex exponentials. You may leave complex exponentials in your answer.