Math 20B
Midterm Exam 2
February 28, 2012
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Version A

Instructions

1. **No calculators or other electronic devices are allowed during this exam.**
2. **You may use one page of notes, but no books or other assistance during this exam.**
3. **Write your *Name*, *PID*, and *Section* on the front of your Blue Book.**
4. **Write the *Version* of your exam on the front of your Blue Book.**
5. **Write your solutions clearly in your Blue Book**

   (a) **Carefully indicate the number and letter of each question and question part.**
   (b) **Present your answers in the same order they appear in the exam.**
   (c) **Start each question on a new page.**

6. **Read each question carefully, and answer each question completely.**
7. **Show all of your work; no credit will be given for unsupported answers.**

0. (1 point) Carefully read and complete the instructions at the top of this exam sheet.

1. (3 points) Find the area enclosed by the polar curve $r = 3\sqrt{1 - \cos(\theta)}$.
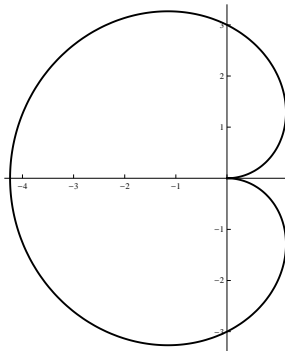
2. (6 points) Evaluate $\displaystyle\int \frac{x^2 - 7}{(x+1)(x-2)}\, dx$.

3. (6 points) Determine the area of the region
$$S = \left\{ (x,y) \mid -2 < x \le 0,\ 0 \le y \le \frac{1}{\sqrt{x+2}} \right\},$$
if it is finite.

4. (4 points) Evaluate the integral $\displaystyle\int e^{3ix} \cos(4x)\, dx$ using complex exponentials. Leave the result in complex exponential form.

5. (4 points) By applying the Comparison Theorem, determine whether $\displaystyle\int_0^\infty \frac{\cos^2(x)}{1 + x^2}\, dx$ is convergent or divergent.