# MAT 123: Introduction to Calculus 

Exam 2, Spring 2007

Thursday, March 22, 8:30pm - 9:30pm

Directions: Do not turn this page over until you are directed to do so. Please fill in your name and your Stony Brook ID number on the lines below. Please then circle the recitation/evening lecture you belong to in the chart below.

There are a total of 4 pages to this exam, not including the cover sheet. Be sure to have all of them. There are four questions on this exam. Point values for each question are shown in brackets to the right of the question number. There are 110 possible points one can earn on this exam, and 100 will be considered a perfect score. Please show all necessary work to solve each problem. Your work will be evaluated for credit.

You may not leave the exam room until 9:00pm at the earliest. You may not use a calculator or any other electronical device for this exam. You may not consult any outside resources, including fellow test-takers, notes, and textbooks. You will also not receive any information from the proctors regarding the wording of any of the exam questions. Good luck!

Name:
Student ID\#:

| RECITATION | TimE | PlaCe | LEADER |
| :---: | :---: | :---: | :---: |
| REC 01 | M 11:45am-12:40pm | Physics P117 | Grigoryan, Suren |
| REC 02 | Th 9:50am-10:45am | Library N3063 | Kifle, Hagos |
| REC 03 | Tu 11:20am-12:15pm | Physics P123 | Vigilante, Richard |
| REC 05 | W 11:45am-12:40pm | Library N4000 | Wertz, Deb |
| REC 08 | M 3:50pm- 4:45pm | Library N3063 | Agcaian, Peter |
| REC 09 | Th 9:50am-10:45am | Physics P117 | Cheng, Jonathan |
| REC 10 | Tu 11:20am-12:15pm | Library N3063 | Ionas, Radu |
| REC 12 | M 11:45am-12:40pm | Lt Engineering 154 | Weng, Luoying |
| REC 13 | W 11:45am-12:40pm | Lt Engineering 154 | Weng, Luoying |
| REC 14 | Th 11:20am-12:15pm | Library N3063 | Vigilante, Richard |
| REC 15 | Th 11:20am-12:15pm | Earth and Space 181 | Ionas, Radu |
| ELC 90 | TuTh 6:50pm-8:10pm | Physics P118 | Bianculli, Nicholas |


| QuESTION | $1(\mathrm{a})$ | $1(\mathrm{~b})$ | $1(\mathrm{c})$ | 2 | 3 | $4(\mathrm{a})$ | $4(\mathrm{~b})$ | $4(\mathrm{c})$ | 5 | TOTAL |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Possible PTS | 15 | 8 | 8 | 15 | 15 | 5 | 14 | 14 | 16 | 110 |
| PTS AWARDED |  |  |  |  |  |  |  |  |  |  |

1. Let $f(x)=-\ln (x-2)$.
(a) [15 points] Graph $f(x)$ on the axes provided below. On the graph, clearly label any asymptotes and $x$-intercepts (if there are any).

(b) [8 points] Find the domain of $f(x)$.
(c) [8 points] Find the range of $f(x)$.
2. [15 points] Solve the following equation for $x$ :

$$
3^{7 x-5}=7^{2 x-3}
$$

3. [15 points] Solve the following equation for $x$ :

$$
\ln (x)+\ln (x+3)=\ln (10)
$$

4. Let $g(x)=\frac{x^{3}}{x^{2}-4}$.
(a) [5 points] Find all $x$-intercepts of $g(x)$.
(b) [14 points] Find the equations of all asymptotes of the graph of $g(x)$.
(c) [14 points] Graph the function $g(x)$ on the axes below. Be sure to label the axes, any asymptotes, and any $x$-intercepts on your graph.

5. [16 points] Stony Brook is repainting the center line, the center circle, and the perimeter of the basketball court. The athletic director purchased enough paint to paint 800 feet in total. The center circle has a radius of 6 feet. Express the area $A$ of the basketball court as a function of $x$, the length of the center line of the court.

