MATH 132 First Midterm

Monday, March 4, 2013

Name: _____ **ID:** _____ **Rec:** ____

Question:	1	2	3	4	5	6	7	8	9	Total
Points:	20	20	20	20	20	20	20	20	20	180
Score:										

There are 9 problems in this exam, printed on 5 pages (not including this cover sheet). Make sure that you have them all.

Do all of your work in this exam booklet, and cross out any work that the grader should ignore. You may use the backs of pages, but indicate **clearly** what is where if you expect someone to look at it. **Books, calculators, electronic devices, extra papers, and discussions with friends are not permitted.** Leave all answers in exact form (that is, do *not* approximate π, square roots, and so on.) If you wrote any formulae on your hand (or other major body part) to use on this exam, refering to such formulae is permitted provided that you detach your hand (or other body part) and turn it in along with the exam. You may not use clothing, fingernails, or similar things for this purpose.

Use non-erasable pen (not red) if you want to be able to contest the grading of any problems. Questions with erasures will not be regraded.

You must give a correct justification of all answers to receive credit.

You have 90 minutes to complete this exam.

Name: _____ **Id:** _____

In questions 1 through 6, evaluate the given definite or indefinite integrals. If the integral does not converge, write **Divergent**. Don't forget the constant of integration where relevant.

20 pts 1. $\displaystyle\int \frac{3x-4}{x^3-x}\,dx$

20 pts 2. $\displaystyle\int_3^6 \frac{dr}{(r-4)^4}$

Name: _____ **Id:** _____

In questions 1 through 6, evaluate the given definite or indefinite integrals. If the integral does not converge, write **Divergent**. Don't forget the constant of integration where relevant.

20 pts 3. $\displaystyle\int_1^2 \frac{\sqrt{t^2-1}}{t}\,dt$

20 pts 4. $\displaystyle\int x^5 \cos(x^3)\,dx$

Name: _____ **Id:** _____

In questions 1 through 6, evaluate the given definite or indefinite integrals. If the integral does not converge, write **Divergent**. Don't forget the constant of integration where relevant.

20 pts 5. $\int \cos^3(x) \sin^2(x)\, dx$

20 pts 6. $\int_0^1 xe^{3x}\, dx$

Name: _____ **Id:** _____

7. The values of a function $f(x)$ are given by the table at right.

x	-0.5	0	0.5	1	1.5	2	2.5
$f(x)$	-1	0	3	2	3	-1	1

15 pts (a) Use Simpson's rule to approximate $\int_0^2 f(x)\,dx$.

5 pts (b) If you know that $-5x^2 \leq f^{(4)}(x) \leq 5x^2$, what is the maximum error in the approximation above?[1]

20 pts 8. Does the improper integral $\int_2^\infty \frac{x^{1/2}+1}{5x-4}\,dx$ converge? Fully justify your answer (note that if the integral converges, you need not give its value).

[1] Feel free to use the fact that $E_s < \frac{(b-a)^5}{180n^4} K_4$, where $K_4 = \max|f^{(4)}(x)|$ for $a \leq x \leq b$.

Name: _____ **Id:** _____

20 pts 9. Find the area lying between the two curves $x + y^2 = 0$ and $x + y = 0$