Instructions:

1. Write your name and section number on the top of each page.

2. NO CALCULATORS, NO CELL PHONES, SHOW ALL WORK
   This document has a title page, a separate page for each problem, two scratch pages for extra work, and a page with a table of integrals. You may detach the last three pages for easier use.

3. (a) Log in to the Exam server at
   http://wwe.math.msu.edu/webwork2/mth_235_fs13_34XXX
   where XXX is one of 270, 290, 300.
   (b) MAKE YOUR BROWSER FULL SCREEN AND DO NOT CHANGE IT DURING THE EXAM.
   (c) Press the "Take Exam-1-FS13-XXX test" button where XXX is your section number. This will start your exam and show you the total possible remaining time. Do not log off or change your Web Site.
   (d) COPY PROBLEMS ONTO WORKSHEET
   (e) Do the exam on the WORKSHEET completely BEFORE entering any answers onto the computer.
   (f) Correct your answers as needed and indicate your final answer on the WORKSHEET in a box.
   (g) Your WORKSHEET solution will be graded and used if there is any issue with the computer.
   (h) When you have finished,
       PLEASE GIVE THE COMPLETED WORK SHEET TO THE PROCTOR (Do not take it with you).
       It will be used to verify your work if there are any computer related issues.

4. GOOD LUCK!
Problem 1
Problem 2
A short table of integrals

1. A a constant $\implies \int A \, dx = Ax + C$,
2. $n \neq 0, 1 \implies \int x^n \, dx = \frac{x^{n+1}}{n+1} + C$
3. $\int \frac{dx}{x} = \log(x) + C$; Integration by parts: $\int u \, dv = uv - \int v \, du$
4. $\int e^{ax} \, dx = \frac{1}{a} e^{ax} + C$; Substitution: $u = u(x)$, $\int u \, du = \int u(x)u'(x) \, dx$
5. $\int xe^{ax} \, dx = e^{ax} \left(\frac{x}{a} - \frac{1}{a^2}\right) + C$
6. $\int x^2 e^{ax} \, dx = e^{ax} \left(\frac{x^2}{a} - \frac{2x}{a^2} + \frac{2}{a^3}\right) + C$
7. $\int \log(ax) = x \log(ax) - x + C$
8. $\int x \log(ax) = \frac{x^2}{2} \log(ax) - \frac{x^2}{4} + C$
9. $\int \frac{dx}{a^2 + x^2} = \frac{1}{a} \arctan\left(\frac{x}{a}\right) + C$
10. $\int \frac{dx}{a^2 - x^2} = \frac{1}{2a} \log\left(\frac{x+a}{x-a}\right) + C$
11. $\int \frac{dx}{\sqrt{a^2 - x^2}} = \arcsin\left(\frac{x}{a}\right) + C$
12. $\int \frac{dx}{\sqrt{x^2 - a^2}} = \log(x + \sqrt{x^2 - a^2}) + C$
13. $\int \frac{dx}{\sqrt{x^2 + a^2}} = \text{arcsinh}\left(\frac{x}{a}\right) + C$
14. $\int \sin(ax) = -\frac{1}{a} \cos(ax) + C$
15. $\int \cos(ax) = \frac{1}{a} \sin(ax) + C$
16. $\int \tan(ax) = \frac{1}{a} \log(\sec(ax)) + C$
17. $\int \cot(ax) = \frac{1}{a} \log(\sin(ax)) + C$
18. $\int \sec(ax) = \frac{1}{a} \log(\tan(ax) + \sec(ax)) + C$
19. $\int \csc(ax) = -\frac{1}{a} \log(\csc(a \cdot x) + \cot(a \cdot x)) + C$
20. $\int x \cos(ax) = \frac{x \sin(ax)}{a} + \cos(ax) + C$
21. $\int x \sin(ax) = \frac{\sin(ax)}{a^2} - \frac{x \cos(ax)}{a} + C$
22. $\int e^{ax} \sin(bx) = \frac{e^{ax}}{a^2 + b^2} (a \sin(bx) - b \cos(bx)) + C$
23. $\int e^{ax} \cos(bx) = \frac{e^{ax}}{a^2 + b^2} (b \sin(bx) + a \cos(bx)) + C$