Name: _____

- There are 12 points possible on this proficiency, one point per problem. **No partial credit will be given.**

- You have one hour to complete this proficiency.

- No aids (book, calculator, etc.) are permitted.

- You do **not** need to simplify your expressions.

- Correct parenthesization is required.

- Do not put a $+C$ where it does not belong, and you must include $+C$ where it is needed.

- You must show sufficient work to justify your final expression. A correct answer for a nontrivial computation with no supporting work will be marked as incorrect.

1. **[12 points]** Compute the following integrals.

   a. $\displaystyle \int (x^{-3} - e^x + 2x^5)\, dx$

   b. $\displaystyle \int \frac{3}{5x - 1}\, dx$

   c. $\displaystyle \int \left(\sin\theta + \sec\theta \tan\theta + \csc(\pi/4) \right) d\theta$

d. $\displaystyle\int e^x \cos(e^x + 1)\, dx$

e. $\displaystyle\int \pi \left(\frac{x-5}{2}\right) dx$

f. $\displaystyle\int \frac{1 + \ln(x)}{2x}\, dx$

g. $\displaystyle \int \left(\frac{1}{x} + e^{3x} + \sec^2(2x) \right) dx$

h. $\displaystyle \int_0^{\pi/2} \frac{3\sin(x)}{\sqrt{1 + 5\cos(x)}} dx$

i. $\displaystyle \int \frac{e^3}{1 + x^2} dx$

j. $\displaystyle\int_1^4 \frac{x^2 - 2\sqrt{x}}{x}\,dx$

k. $\displaystyle\int bx^p\,dx$ where b and p are positive constants

l. $\displaystyle\int x(x+2)^9\,dx$