**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.** $\displaystyle\int_1^4 e^4 + x^{-3} + x^2\,dx$

**b.** $\displaystyle\int_0^{1/3} \sin(\pi x)\cos^5(\pi x)\,dx$

**c.** $\displaystyle\int 5e^x + \frac{2}{1+x^2}\,dx$

**d.** $\int \frac{3}{2} - \frac{2}{3x}\,dx$

**e.** $\int \sin x + \frac{2}{x^{3/5}}\,dx$

**f.** $\int 3e^{2x}\sec^2(e^{2x})\,dx$

**g**. $\int 2x\sec(x^2)\tan(x^2)\,dx$

**h**. $\int ax^{-5} + b\sin x\,dx$

**i**. $\int (\theta - 2)(3\theta + 1)\,d\theta$

**j.** $\int 2x(x+3)^{12}\,dx$

**k.** $\int \frac{1}{x}\frac{1}{\sqrt{1-(\ln x)^2}}\,dx$

**l.** $\int \ln(5)+e^x\,dx$