Name: ———————————————————————

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

- You have 1 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 do put a "$+C$" in the correct place at least one time.

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

- **Circle or box your final answer.**

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

   a. $\displaystyle\int_0^\pi 4x^3 + \sin x \, dx$

   b. $\displaystyle\int \left(x^{1/3} + \frac{4}{x} + e^2\right) dx$

   c. $\displaystyle\int_0^1 t^2(4-t)\, dt$

d. $\displaystyle\int \sin t \cos t \, dt$

e. $\displaystyle\int 3e^x (\sec(e^x))^2 \, dx$

f. $\displaystyle\int \pi \left(\frac{7x-6}{2}\right) dx$

g. $\displaystyle\int \frac{1}{1+9x^2}\,dx$

h. $\displaystyle\int \frac{x+\cos x}{2\sin x + x^2}\,dx$

i. $\displaystyle\int \frac{\ln x + 6}{x\ln x}\,dx$

j. $\displaystyle\int \sqrt{4x+5}\,dx$

k. $\displaystyle\int \sec(5x)\tan(5x)\,dx$

l. $\displaystyle\int x^3(x^4-7)^5\,dx$