Name: _____

- There are 12 points possible on this proficiency: one point per problem with no partial credit.

- You have 1 hour to complete this proficiency.

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

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

- For at least one problem you must indicate correct use of a constant of integration.

- 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. $\displaystyle\int_1^4 \frac{x+1}{\sqrt{x}}\, dx$

   b. $\displaystyle\int_0^{1/2} (6 - \cos(\pi x))\, dx$

   c. $\displaystyle\int (x+3)(5x+2)\, dx$

d. $\int xe^{9x^2}\,dx$

e. $\int \dfrac{\sin(x)-1}{\cos(x)+x}\,dx$

f. $\int \dfrac{e^x}{(12+e^x)^4}\,dx$

g. $\displaystyle\int \sec(1-2x)\tan(1-2x)\,dx$

h. $\displaystyle\int \frac{8}{1+x^2}\,dx$

i. $\displaystyle\int x(x+1)^{10}\,dx$

j. $\displaystyle\int \sqrt{2}\,(\sec(x))^2\ dx$

k. $\displaystyle\int \left(\frac{1}{x} + \frac{\ln(x)}{x}\right)\ dx$

l. $\displaystyle\int \left(\sqrt[3]{x^5} + \sqrt[3]{4}\right)\ dx$