Name: _____

- There are 12 points possible on this proficiency: one point per problem with no partial credit.
- You have 30 minutes 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.
- Circle or box your final answer.
- You must use parentheses correctly. A mis-parenthesized answer is incorrect. Do not write $8x \cdot -x^2$ to indicate $8x(-x^2)$, and definitely do not write $8x \cdot -x^2 + 2$ if you mean $8x(-x^2+2)$.

1. [12 points] Compute the following definite/indefinite integrals.

a. $\displaystyle\int (-2x^5 + \sin(x))\, dx$

b. $\displaystyle\int \cos(6x)\, dx$

c. $\displaystyle\int_1^2 xe^{x^2}\, dx$

d. $\int \left(\frac{x}{2}+\frac{4}{x}+\frac{6}{5}\right)\,dx$

e. $\int \frac{1-2\sin(2x)}{x+\cos(2x)}\,dx$

f. $\int \frac{7}{3x(\ln x)^2}\,dx$

g. $\displaystyle\int \frac{1}{\sqrt{1-x^2}}\,dx$

h. $\displaystyle\int \frac{\arctan(x)}{1+x^2}\,dx$ (recall $\arctan(x) = \tan^{-1}(x)$)

i. $\displaystyle\int (e^{-2x} + \sec(x)\tan(x))\,dx$

j. $\displaystyle\int_{-2}^{1} x(3-x)\,dx$

k. $\displaystyle\int \frac{x^4}{\sqrt{6-x^5}}\,dx$

l. $\displaystyle\int \frac{x}{x+2}\,dx$