Name: ――――――――――――　　　**Instructor (circle):　Maxwell　Jurkowski　Sus**

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

- You have 60 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 your final answer.

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

   a. $\displaystyle \int_0^{\pi} \left(5e^x + 3\sin(x)\right)\ dx$

   b. $\displaystyle \int \frac{(1+x)^2}{2x}\ dx$

   c. $\displaystyle \int \left(x^2 - 3\ln 2\right)\ dx$

d. $\int \sec\left(\dfrac{\pi x}{2}\right) \tan\left(\dfrac{\pi x}{2}\right) dx$

e. $\int \dfrac{(\arctan(x))^2}{x^2+1} dx$

f. $\int \sqrt{x}(x^2+3x+2) dx$

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

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

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

j. $\displaystyle\int \frac{\cos(\ln x)}{x}\, dx$

k. $\displaystyle\int \frac{6x^2}{x^3+1}\, dx$

l. $\displaystyle\int (x-1)e^{(x-1)^2}\, dx$