1. Calculate the (indefinite) integral $\int \sec^3(x)\,dx$.
2. Plot the area under the curve of $\sec^3(x)$ from $x = [-1, 1]$.
3. Use Mathematica to find the definite integral $\int_{-1}^{1} \sec^3(x)\,dx$.
4. Use the Trapezoidal Rule to calculate the integral with $n = 5$ subintervals.
5. Use Simpson's Rule to do the same with $n = 10, 20$, and 40 subintervals.

Formulas:

Trapezoidal $\int_a^b f(x)\,dx \approx \frac{\Delta x}{2}\left[f(x_0) + 2f(x_1) + \ldots + 2f(x_{n-1}) + f(x_n)\right]$ where $\Delta x = \frac{b-a}{n}$ and $x_i = a + i\Delta x$.

Simpson's $\int_a^b f(x)\,dx \approx \frac{\Delta x}{3}\left[f(x_0) + 4f(x_1) + 2f(x_2) + 4f(x_3) + \ldots + 2f(x_{n-2}) + 4f(x_{n-1}) + f(x_n)\right]$ where n is even and $\Delta x = (b-a)/n$.