Let $I = \int_0^1 e^{-x^2}\, dx$.

Use Theorem 1 to answer the following.

1. How close will L_{5000} approximate I? R_{5000}? T_{5000}?

2. Find a value of n so that L_n approximates I within 0.00001 of the actual value.

3. Repeat #2 but with T_n.

Recap for Today

- Even if we can't find an antiderivative, we can approximate an integral. The goal is to determine how close the approximation is to the actual value of the integral.

- If the $f(x)$ is monotone on $[a, b]$, we can determine how close L_n, R_n and T_n are to $\int_a^b f(x)\,dx$ *without knowing the exact value of the integral!*