Let $\mathcal{I} = \int_{-\pi}^{\pi} e^{\sin(x)}\, dx$.

Approximate $\mathcal{I}$ accurate within

1. 0.01 using a right sum
2. 0.001 using a trapezoid sum
3. 0.0001 using a midpoint sum

Let $\mathcal{I} = \int_0^2 e^{x^2}\, dx$

1. Plot the integrand to verify that it is monotone over the interval of integration.

2. Calculate L_{1500} and R_{1500}. How close are these to the actual value of $\mathcal{I}$?

3. Use Theorem 3 to find a value for n such that $|\mathcal{I} - L_n|$ is guaranteed to be less than 0.10. How does this compare to #2? Explain.

4. Will M_{100} overestimate or underestimate $\mathcal{I}$? How about T_{100}?

5. Calculate M_{100} and T_{100}.
   How close are these to the actual value of $\mathcal{I}$?

6. What does Theorem 3 tell you about $|\mathcal{I} - M_{100}|$?
   How does this compare to #5? Explain.