

$$\text{Let } \mathcal{I} = \int_0^1 \sin(x^2) dx$$

1. Use WolframAlpha to plot $f(x) = \sin(x^2)$ from $x = 0$ to $x = 1$
2. Use WolframAlpha to calculate $L(10)$ and $R(10)$
3. How does \mathcal{I} compare to $L(10)$ and $R(10)$?
4. How close is $L(10)$ to the exact value of \mathcal{I} ?
5. Use $L(n)$ to approximate \mathcal{I} within 0.02 of its exact value.