

Let $I = \int_0^1 x \sin(x^2) dx$

1. Write L_{10} and L_{50} using sigma notation (without using Maple).
2. Write R_{10} and R_{50} using Sigma notation (again, without using Maple).
3. Without calculating any of them, rank I , L_{10} and R_{10} in increasing order.
4. Can you draw any conclusions about how well L_{10} approximates I (without calculating I)?
5. Use the formal definition of the integral to write

$$I = \int_0^1 x \sin(x^2) dx \text{ as a limit.}$$