Let $I=\int_{0}^{1} x \sin \left(x^{2}\right) d x$

1. Write out $L_{5}$ without Sigma Notation.
2. Use Sigma notation to write $L_{5}$.
3. Calculate the numerical value of $L_{5}$. Without finding the exact value of $I$, decide whether $L_{5}$ over-estimates or under-estimates $I$.
4. Write $L_{10}$ and $L_{50}$ using sigma notation.
