

Let $f(x) = x^3$ and consider the area of the region that is under the graph of $y = f(x)$ and above the x -axis on the interval $[0, 4]$.

Approximate the area of the region by calculating

1. L_4 , the left sum with four subdivisions
2. R_4 , the right sum with four subdivisions
3. M_4 , the midpoint sum with four subdivisions

Which will be an under-approximation?

Which will be an over-approximation?