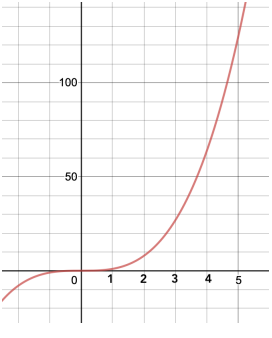
Let $f(x) = x^3$ and consider the area of the region that is under the graph of $y = f(x)$ and above the x-axis on the interval $[1, 5]$.

1. Approximate the area of the region by calculating
   (a) L_4, the left sum with four subdivisions
   (b) R_4, the right sum with four subdivisions
   (c) T_4, the trapezoid sum with four subdivisions



2. Which of your answers will be an under-approximation?
3. Which of your answers will be an over-approximation?
4. Can you relate your answers to the last two questions to f' and/or f''?