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 $[0, 4]$.

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) M_4, the midpoint sum with four subdivisions

   (d) 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?