Compute the following three sums

1. (1 point)
\[ \sum_{i=1}^{n} 1 \]

2. (1 point)
\[ \sum_{i=0}^{3} 3^i \]

3. (3 points)
\[ \sum_{k=1}^{4} f(x_k^*) \Delta x_k \]

where \( f(x) = \sqrt{x} \) and \( x_k = 2k \) and \( \Delta x_k = x_k - x_{k-1} \) and \( x_k^* \) is the midpoint of \( x_k \) and \( x_{k-1} \)
4. (2 points) Compute the antiderivative of $f(x) = px^{p-1}$

5. (3 points) Approximate the area under the curve $f(x) = 1/x$ on the interval $[1, 2]$ using 4 rectangles. Is your estimate an underestimate or an overestimate?