1. Let \( f(x) = \sqrt{x} \). Make use of the definition of the derivative to explain why the two terms \((5 + 0.00003)^{\frac{1}{2}} - \sqrt{5}\) and \(\frac{1}{2\sqrt{5}}(0.00003)\) are nearly equal to each other.

2. Let \( y = f(x) \) be a function and let \([a, b]\) be a closed interval on the \(x\)-axis over which the function is continuous. The definition of \(\int_a^b f(x) \, dx\) (it is a number that depends on the function as well as \(a\) and \(b\)) is the result of a process. Describe this process precisely and distinguish along the way between the “working definition” of \(\int_a^b f(x) \, dx\) and the true value of \(\int_a^b f(x) \, dx\). Do so without mentioning rectangles or area and without referring to the Fundamental Theorem of Calculus.
3. Use the graph of $y = \sqrt{16 - x^2}$ to evaluate $\int_{0}^{4} \sqrt{16 - x^2} \, dx$. 