

Quiz 8. Math 10-270. April 4, 2012. Name

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 $\int_0^4 \sqrt{16 - x^2} dx$.