Quiz 8. Math 10-270. April 17, 2013.   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 symbol $\int_a^b f(x)\, dx$ is a number that depends on the function as well as a and b.

The definition of this number is the result of a process. Describe this process precisely (making use of

the number line below) and distinguish along the way between the "working definition" of $\int_a^b f(x)\, dx$

and the true value of $\int_a^b f(x)\, dx$. (**Your description of this process should be "abstract" and
should not mention rectangles or area or the Fundamental Theorem of Calculus.**)