$= \sqrt{x}$

Another example,

$$\int \cos(t)\, dt = \sin(t) + C$$

$$\frac{d}{dx}(\sin(t) + C) = \cos(t)$$

Functions like polynomial, rational, exponential, logarithmic, radical, trigonometric and the inverses of these functions will be dealt with in the course. Not all functions have antiderivatives, but most do.

The following materials are covered in chapter 5.1 - 5.4 of the textbook.

Let *f(x)* be a continuous function in a closed interval [*a*, *b*],

Continuous means,

$$\lim_{x \to C} f(x) = f(C)$$

$\forall C \in [a, b]$

The above means that between the x-value of '*a*' and x-value of '*b*', as *x* approaches *C*, the limit is equal to the y-value of the function at the x-value of *C*, which means that the function f(x) is continuous without any kind of discontinuity in the closed interval [*a*, *b*].

Now, let's look at Riemann sum. Let $n \in \mathbb{N} = \{1, 2, 3, \ldots.\}$

The above expression means *n* is a natural number like 1, 2 ,3, etc..

The symbol '$\mathbb{N}$' means natural number.

Let there be a closed interval [a, b].

Let $\Delta x = \frac{b-a}{n}$

Let *i* = 1,2,.....n

Let the right-hand endpoint of the i^{th} subinterval be x_i

Then, $x_i = a + i(\Delta x)$

The above information, on a curve *f(x)*, is shown in picture below.