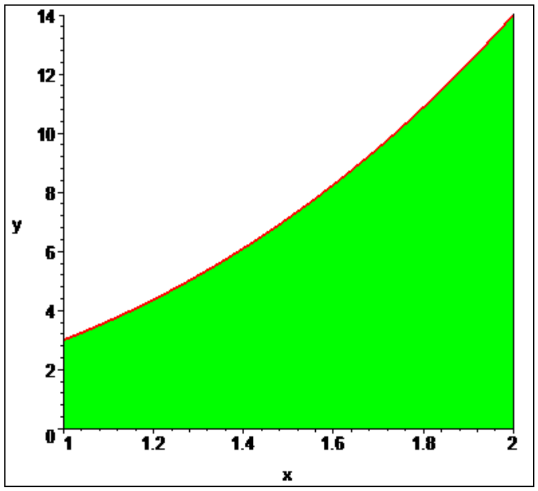
FUNDAMENTAL THEOREM OF CALCULUS (PART II)

Objective of today's lesson.

The main objective of today's lesson was to evaluate the integral of the function **f(x)** with respect to **x** from **a** to **b** by simply subtracting the values of the antiderivative **F** of the function **f** at the endpoints of the interval **[a, b]**.

However, it was astonishing, that the integral of **f(x**) with respect to **x** from **a** to **b**, that was defined by a troublesome procedure that involved all of the values **f(x**) for a closed interval from **a** to **b** could be found if we knew the values of **F(x)** at only two points, **a** and **b**. This gives the area under the curve:



Although the theorem may be breathtaking at first sight, it is reasonable to define it in physical terms.

The essence of today's activity is useful especially when we will be evaluating problems like say velocity **v(t)** and position **s(t)** of a particle among other problems. If **v(t)** is the velocity of a particle and **s(t)** is its position at interval of time **[a, b]**, then **v(t)=s'(t)**, **s** becomes the antiderivative of **v**. Thus, by integrating the velocity on the interval **[a, b]**, we end up finding s(b) – s(a), or the displacement of the particle.