5.00

Please write an outline of the main contents of the lecture.

- graph of function $f(t)$
  - var y, t
  - boundary a, b
- ~~Lower~~
- Riemann Int
  area under two end points
  $\int_a^x f(t)\,dt$
  $= F(x)$ function of $x \in [a, b]$
- Fund Thm of Calc
  Derivative of $\frac{dF(x)}{dx} = f($
  $\Rightarrow$ 1) Every cont func. f has antiderivative $F(x)$
  2) connects derivatives and Integrals
- Eg

Please write an outline of the main contents of the lecture.

- Uniform distribution

$X \sim Unif(a,b)$ $\quad f(x) = \frac{1}{b-a}$ $\quad x \in [a,b]$

- $F(x) = \begin{cases} 0 & x<a \\ \frac{x-a}{b-a} & a \le x \le b \\ 1 & x>b \end{cases}$

- CDF: $F(x) = P(X \le x)$

- Derive for Unif

$$\int_{-\infty}^{x} f = \int_a^x \frac{1}{b-a}\,dx = \frac{u}{b-a}\Big|_a^x$$

- Moment and Var

$\frac{e^{bt} - e^{t}}{(b-a)t}$ $\quad \frac{(b-a)^2}{12}$

Please write an outline of the main contents of the lecture.

- Euler's formula

$$e^{ix} = \cos(x) + i\sin(x)$$

- $\sin^2 + \cos^2 = 1$

$$e^{ix} \cdot e^{ix} = 1 = (c + i\cdot s)(c - i\cdot s)$$

- Angle sum

$$e^{ia} \cdot e^{ib} = (c\,a + i\,s\,a)(\cos\cdot b + i\,s\,b)$$

$$e^{i(a+b)} = c\,a\,c\,b + \cancel{i}\,s\,a\,s\,b \quad ①$$

$$(c\,a\,b + s\,a\,\cos b)\,i \quad ②$$

$$e^{i(a+b)} = \cos(a+b) + i\,\sin(a+b)$$

match real and complex component

$\cos(a+b) = ①$ $\sin(a+b) = ②$

- Double angle $a = b \Rightarrow$