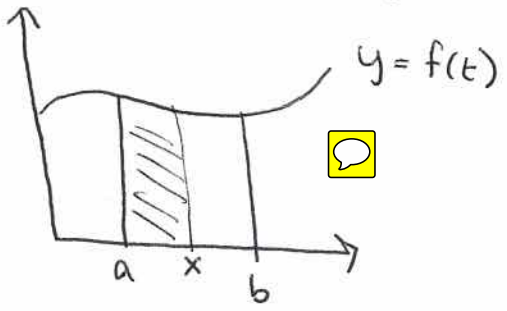
Please write an outline of the main contents of the lecture.

- Continuous functions - over [a, b]



5/20/2015
4PM
Michele Cunning
Summary / Search Task
Group 3
(B, C, A)
K S 1.

- Definite Intergral
  - $\int_a^x f(t)\,dt = F(x)$
  - gives area
- Fundamental Thm of Calc

$$\frac{dF}{dx} = \frac{\partial}{\partial x}\int_a^x f(t)dt = f(x)$$

↳ Antiderivitive

→ Every cont. f has an antiderivative F(x)

- Example of fundamental

$$\underbrace{\frac{\partial}{\partial x}\int_{\pi}^{x} \frac{\cos^2 t}{\ln(t-\sqrt{t})}\,dt}_{f(t)} = \underbrace{\frac{\cos^2 x}{\ln(x-\sqrt{x})}}_{f(x)}$$

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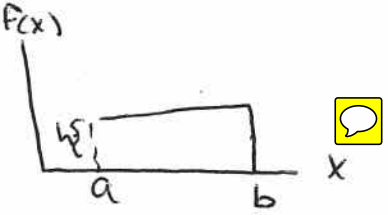
Uniform Distribution

- Definition

$X \sim Unif(a, b)$

- Example



$area = (b-a)h = 1$

$\Rightarrow h = 1/b-a$

- PDF

$$f_x(x) = \frac{1}{b-a} \quad a \leq x \leq b$$

- Derivation of CDF

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

CDF Definition

$F_x(x) = P(X \leq x$

- When $x \in [a, b]$

$F_x(x) = \frac{x-a}{b-a}$

- When $x > b$

$F_x(x) = 1$

$E(x) = \frac{b+a}{2}$, $Var(x) = \frac{(b-a)^2}{2}$

↳ Variance

- Moment Generating function

$$M_x(t) = \frac{e^{bt} - e^{at}}{(b-a)t}$$

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

Prove Trig From Eulers

- Eulers

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

→ Prove $\sin^2(x) + \cos^2(x) = 1$

- Proof

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

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

multiplying

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

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

$$\Longrightarrow 1 = \cos^2 x + \sin^2 x$$

- Angle Sum Formula

$$e^{ia} = \cos a + i\sin a$$

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

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

→