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

Problem
- Denoting the area under curve on some continuous function x.
- Use Riemann interval

$$F(x) = \int_{a}^{x} f(t)\,dt \quad x \text{ in } [a,b]$$

Fundamental theorem of calculus

$$\frac{dF}{dx} = \frac{d}{dx} = \int_{a}^{x} f(t)dt = f(x)$$

Allows us to solve the Riemann integral using derivative

Example

$$\frac{d}{dx} \int_{\pi}^{x} \frac{\cos^2 t}{\ln(t-\sqrt{t})}\,dt = \frac{\cos^2 x}{\ln(x-\sqrt{x})}$$

5/19/2015
12PM
Rosy

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Group 2

C	A	B
K	5	1

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

Actuarial Path

random variable X
with lower / upper limits a, b

Since X has a uniform distribution, equally likely all values between a & b

~~Height~~

Each value from a to b has prob. $\frac{1}{b-a}$
(Area of rectangle

CDF is $\frac{x-a}{b-a}$ for $[a, b]$

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Proving formulas with Eulers

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

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

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

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

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

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

Angle sum formula

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

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

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

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

set a, b to x and Save