Panel 1

Abducted by an alien circus company, Professor ~~Doyle~~ is forced to write calculus equations in center ring.

Math 2511

Calculus 3

Welcome!

Bert Wachsmuth

Panel 2

About this Course:

http://pirate.shu.edu/~wachsmut

Dyknow: Server:

dyknows://secure.dyknow.com/shu.edu

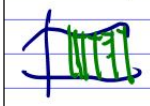
user: 9-letter

pass: 9-letter

Maple, Wolfram Alpha

Panel 3

Calc 1 – Overview

	Def.	Geometry	How-to
Limit	Given $\varepsilon > 0$ there is $\delta > 0$ such that. if $\lvert x-c\rvert < \delta$ $\Rightarrow \lvert f(x)-L\rvert < \varepsilon$	if x gets close to c, then $f(x)$ gets close to L	plug in, Loops for the Sub l'Hopital's Rule
Continuity	$\lim_{x\to c} f(x) = f(c)$	graph has no holes, gaps	graph it
Differentiation	$\lim_{h\to 0} \frac{f(x+h)-f(x)}{h}$	slope of tangent	power, product, quotient chain.
Integration 	$\int_a^b f(x)\,dx$. $\lim_{n\to\infty} \sum_{i=1}^{n} f(x_i)\,\Delta x_i$	area under curve ($f>0$), else net area	anti deriv, fund. thm of calc

Panel 4

Calc 1 : Some Refreshers

① $\lim_{x\to 1} \frac{x^2-1}{x} = \frac{0}{1} = 0$, $\lim_{x\to 2} \frac{x^2-4}{x-2} = \lim \frac{2x}{1} = 4$ $\lim_{x\to 0} \frac{x^2\sin(x)}{1-\cos(x)} = \frac{2x\sin(x)+x^2\cos(x)}{+\sin(x)}$ = 7 4V

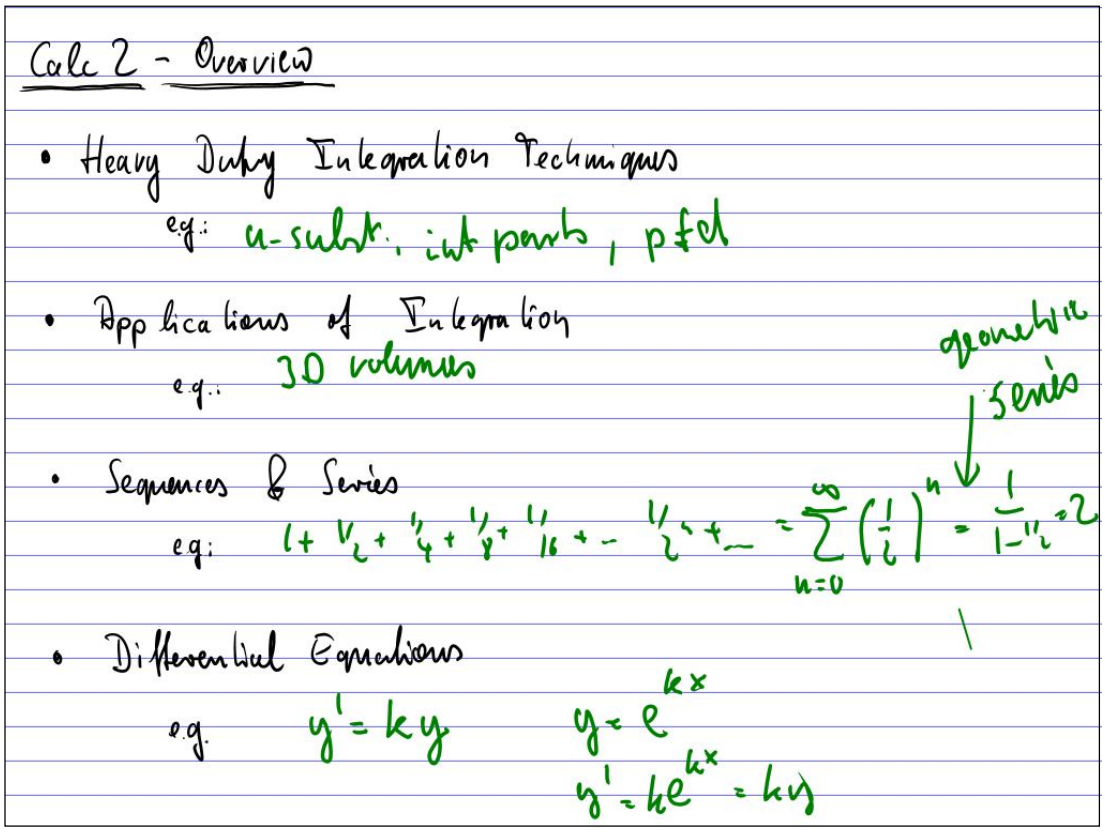
② $f(x) = x^2 - \sin(x) + e^x - \sqrt{x} + \ln(x)$

$f'(x) = 2x - \cos(x) + e^x - \frac{1}{2}x^{-1/2} + \frac{1}{x}$

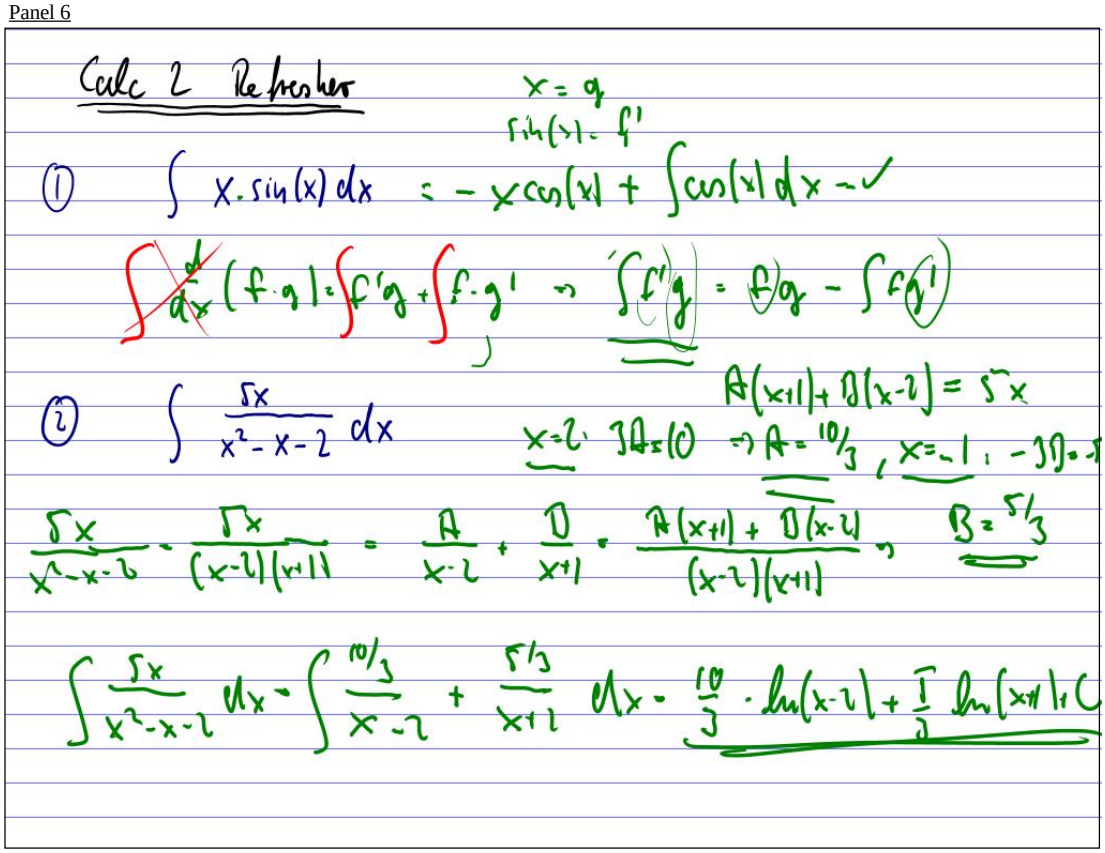
$g(x) = \frac{x\sin(x)}{\sqrt{1-x^2}}$, $g'(x) = \frac{(\sin(x)+x\cos(x))\sqrt{1-x^2} - x\sin(x)\left(\frac{1}{2}(1-x^2)^{-1/2}(-2x)\right)}{(\sqrt{1-x^2})^2}$

③ $\int 5x - 3\sqrt{x} + e^x - \frac{5}{x} - \frac{6}{x^2}\,dx = \frac{5}{2}x^2 - \frac{3}{\frac{3}{2}}x^{3/2} + e^x - 5\ln|x| + \frac{6}{x} + C$

Panel 5



Panel 6



Panel 7

Calc 3: Int. and Diff. of functions with several variables!!

$f: \mathbb{R} \to \mathbb{R}$, $f(x) = x^2$

$f: \mathbb{R} \to \mathbb{R}^2$, $f(t) = (\cos(t), \sin(t))$

$f: \mathbb{R} \to \mathbb{R}^4$, $f(t) = \langle \cos(t), \sin(t), t, t^2 \rangle$

$f: \mathbb{R}^2 \to \mathbb{R}$, $f(x,y) = x^2 + 5xy$

$f: \mathbb{R}^3 \to \mathbb{R}$, $f(x,y,z) = xy^3$

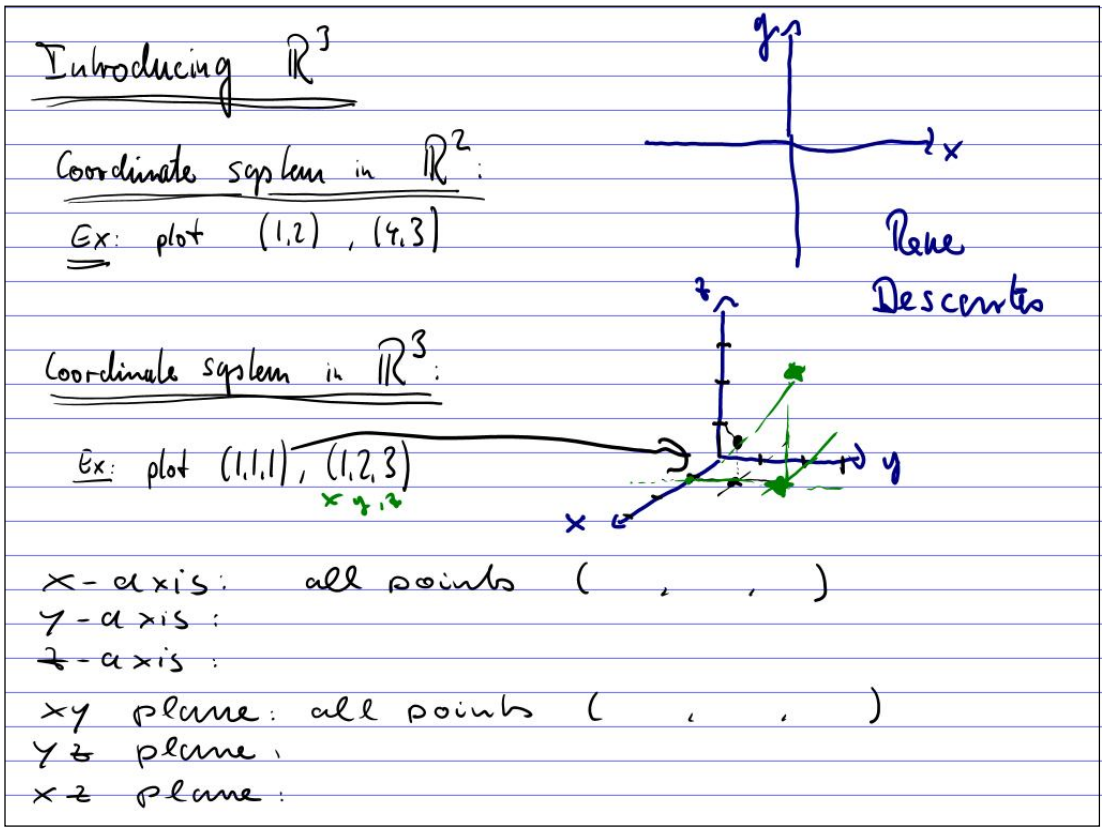
$f: \mathbb{R}^2 \to \mathbb{R}^3$, $f(x,y) = \left\langle xy, x^2+y^2, \frac{x}{1+y^2} \right\rangle$

Panel 8

$f: \mathbb{R} \to \mathbb{R}$

$f: \mathbb{R} \to \mathbb{R}^2$

Panel 9



Panel 10