$$P = \epsilon \left(P_2 + P_4 \right)$$

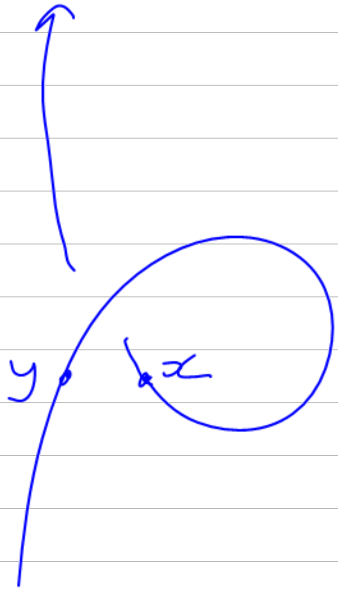
$$\begin{pmatrix} 1 & 1-t \\ 0 & t \end{pmatrix} \quad\quad \sigma_{ij} \longmapsto \begin{pmatrix} 1 & & & & & \\ & 1 & & & & \\ & & 1 & 1-t & & \\ & 0 & & t & & \\ & & 0 & & 1 & \\ & & & & & 1 \end{pmatrix}$$

$$\downarrow$$

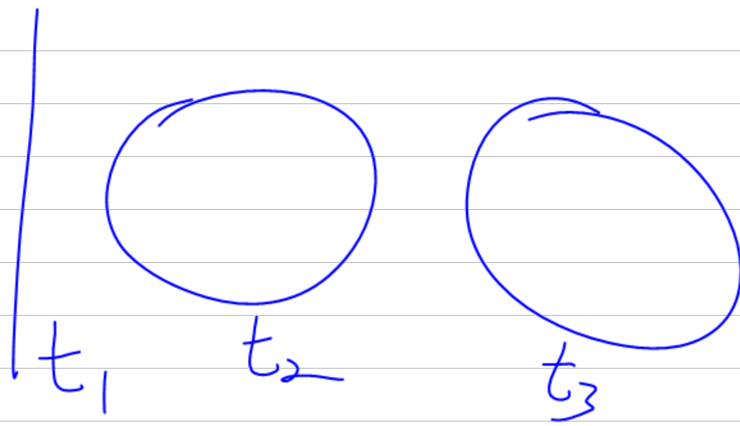
$$\begin{pmatrix} 1 & -1 \\ -1 & 1 \end{pmatrix} \quad\quad t_{ij} = \begin{pmatrix} 0 & 0 & & \\ & 1 & -1 & \\ & -1 & 1 & \\ 0 & & & 0 \end{pmatrix}$$

$$R = \mathbb{E}\left(\left(e^{t+\epsilon} - 1 \right) \left(P_1 - P_2 \right) \supset G_2 \right)$$

$$R \sim e^{yx+ba}$$

$e^W =$ 

$\to \mathbb{E}\left(yx + ba + \underset{\text{stuff}}{ab} + \rho\right)$



$$[x, ay] = xy + at$$
$$\| $$
$$[a, xy]$$

$$W = ta + yx \qquad [x, y] = t$$

$$a = \frac{W}{t} - \underbrace{\frac{y}{t}}_{\rho} x \qquad [x, \rho] = 1$$

$$F(\epsilon) = \int_0^\infty \frac{e^{-x}}{1+\epsilon x}\,dx \sim \int_0^\infty dx \sum_{n=0}^\infty e^{-x}(-\epsilon x)^n$$

$\epsilon > 0$ $\qquad |x| < \frac{1}{\epsilon}$

$$= \sum_{n=0}^\infty (-\epsilon)^n \int_0^\infty e^{-x} x^n\,dx$$

$$= \sum_{n=0}^\infty (-1)^n n!\, \epsilon^n$$

$$\sum \frac{1}{n!}\epsilon^n$$

Sin 100

Aug 11, 2020

Q If P_1 is $2k+2$-docile, show that so is

$$\log(\Phi(e^{P_1})) \in U(-)[[\epsilon]]$$

If P_2 is $4k$-docile, so is

$$\log(\Phi(P_2))$$

$$\begin{tikzcd} S \arrow[r, "?"] \arrow[d, "\Phi"] & S \arrow[d, "\Phi"] \\ U \arrow[r, "\log"] & U \end{tikzcd}$$

$$\mathcal{D}(e^{\mu xy}) = \sum \frac{\mu^n x^n y^n}{n!} \xrightarrow{\log} \log(\mu+1)\cdot xy$$

in U $\quad e^{\lambda xy} = \mathcal{D}\left(e^{(e^{\lambda}-1)xy}\right)$

$\log_u \mathcal{D}\left(e_s^{\lambda Q}\right)$ is quadratic?

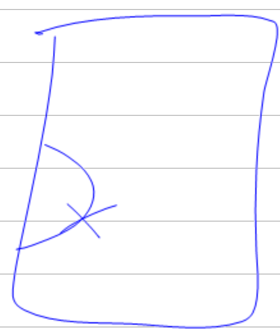
$\partial_\lambda : \mathcal{D}(e^{\lambda Q})^{-1}\,\mathcal{D}(Q e^{\lambda Q})$

$e^{P_0 + tP_1 + t^2 P_2}$

where $wt(P_k) \le 2k+2$ $\qquad$ P_{linear}

at $k=0$ $\quad wt(P_0) \le 2$ $\qquad$ $e(t)a$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ $\uparrow$ $wt\ 2$



EDDO

no $t^2 a$ $\qquad$ no $\alpha\beta$

neither

Aug 17, 2020

$Q \longmapsto Q'$

$\underline{\underline{L}} + \underline{\underline{Q}} + \underline{\underline{P}}$

no $\quad$ $(n-k)k$

$$\underline{\underline{e^{Q}\,p}} \sim \underline{\underline{e^{Q+p}}}$$

$$\langle a_1 a_2 a_3,\ e^{q_{ij}\,x_i y_j}\,p(\bar{x},\bar{y})\rangle$$

n^2

$$\frac{\partial}{\partial\alpha}\rho(A) \qquad \deg\rho = n$$

$$\frac{\partial}{\partial\alpha}\left(\sum_{k=-n}^{n}\lambda_k e^{k\alpha}\right) = \sum_{k=-n}^{n} k\lambda_k e^{k\alpha}$$

$$\frac{d}{dx}f = \lim \frac{f(x+h)-f(x)}{h}$$

$$\frac{\varsigma}{\varsigma x}f = f(x+1)-f(x)$$

$y^n \to n y^{n-1}$

$$\mathrm{ad}_x\, f(y) = b\,f'(y)$$

$$\mathrm{ad}_x\, f(a) = \cancel{a}\,f(a+1)-f(a)$$

$$a^{(n)} = a(a-1)(a-2)\ldots(a-n+1)$$

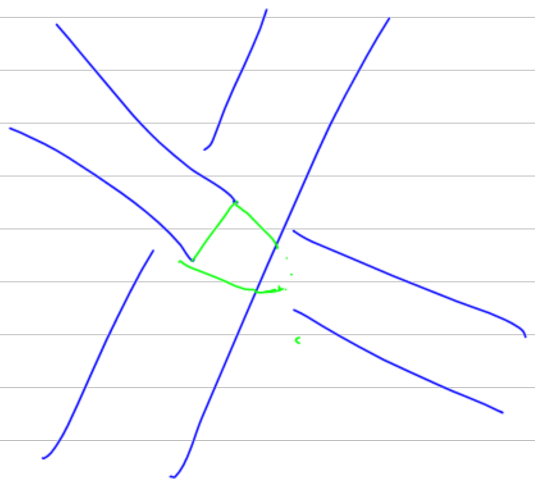
$$L : a^n \longmapsto a^{(n)}$$

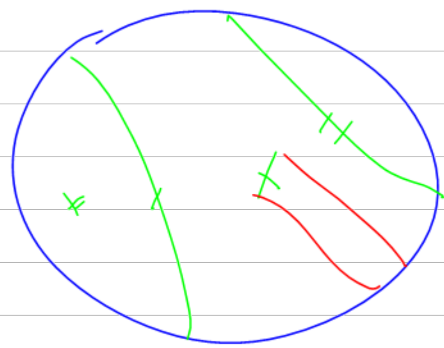
$$g(L) = \sum \frac{1}{n!}\alpha^n a^{(n)}$$

$$= (1+\alpha)^{\wedge}$$

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

$$Df = f \qquad (f)' = (1 \quad 1)$$





$$u = \mathrm{ABS}(u) \Rightarrow u \geq 0$$

$$\frac{1}{1-\alpha} = \frac{1}{-(\alpha + \frac{\alpha^2}{2} + }$$

$$= \frac{-1}{\alpha}\left(\frac{1}{1+\frac{\alpha}{2}}\right)$$

$$\left\langle \frac{1}{\alpha}, \alpha^n \right\rangle = \partial_\alpha^n \frac{1}{\alpha}\Big|_{\alpha=0}$$

Boom!

$$\left\langle \frac{1}{\alpha}, e^{\lambda a} \right\rangle = e^{\lambda \partial_\alpha} \frac{1}{\alpha}\Big|_{\alpha=0}$$

$$= \frac{1}{\alpha+\lambda}\Big|_{\alpha=0} = \frac{1}{\lambda} \underset{\lambda<0}{=} \int_0^\infty e^{\lambda a}\, da$$

$$\left\langle \frac{1}{\alpha}, f \right\rangle \rightsquigarrow \int_{-\infty}^{\infty} \frac{\hat{f}(\lambda)}{i\lambda}\, d\lambda$$

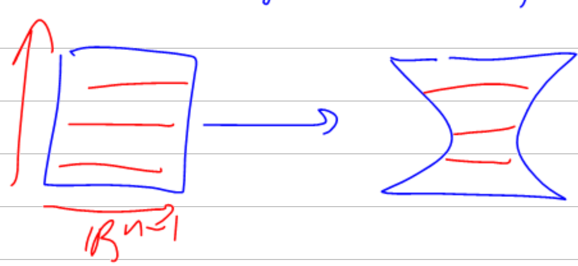
$$e^{Q_1} /\!/ e^{Q_2} = e^{Q} \qquad \frac{1}{1-FG} = \sum (FG)^n$$

$$e^{Q} \qquad P$$

---

cov if g is l.p.

$$g\begin{pmatrix} x_1 \\ \vdots \\ x_n \end{pmatrix} = \begin{pmatrix} \cancel{x} \\ z \\ x_n \end{pmatrix} \qquad \begin{pmatrix} \boxed{n-1} & \\ & \end{pmatrix}$$

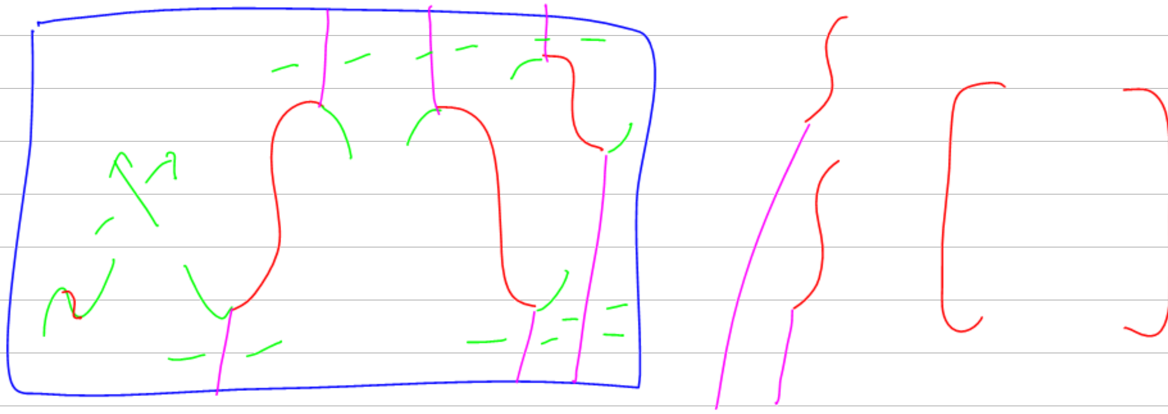


$$(x_1 \ldots x_n) \longmapsto (y_1 \ldots y_n)$$

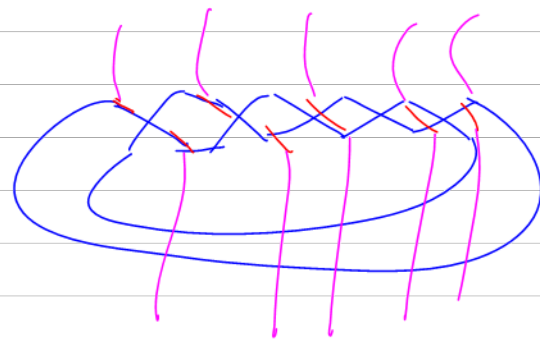
$$(x_1 \ldots x_{n-1}, y_k)$$

Knots $\xrightarrow{\text{Alex}}$ Braids

R-moves $\longleftarrow$ M-moves



$n \cdot \sqrt{n}$



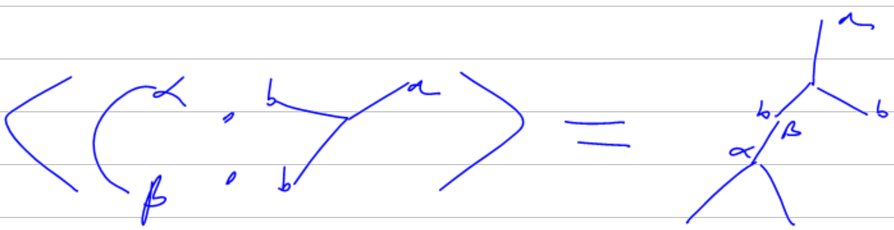
linear.

$$e^{L+\lambda_8} = F_L(\lambda_8) \qquad \text{to deg } 8$$

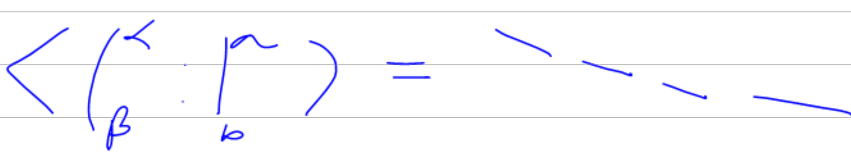
$x \quad \bar{x} \quad \tilde{x}$

$R \quad \bar{R} \quad \tilde{R}$

$$\partial_x \partial_y e^z = \partial_x\left((\partial_y z) e^z\right)$$



$$\begin{array}{c|cc} & & \\ \alpha & 0 & 1 \\ \beta & 1 & 0 \\ \hline & \alpha & \beta \end{array}$$



1. no dens.
2.

$$(w, A) \longmapsto w\,\Lambda^*\!\left(\frac{A}{w}\right)$$

$$\begin{tikzcd} \mathbb{R}\times M_{n\times n}(\mathbb{R}) \arrow[r, "\text{non}", "\text{linear}"'] \arrow[loop below, "m^{ij}_k"] \arrow[loop below, "tr_i"'] & \mathrm{End}(\Lambda^*(\mathbb{R}^n)) \arrow[loop below, "m^{ij}_k"] \arrow[loop below, "tr_i"', "\text{linear}"] \end{tikzcd}$$

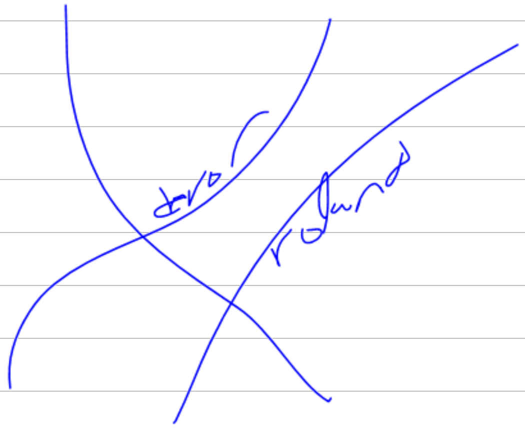
$$\begin{tikzcd} \mathbb{R}^n \arrow[r] \arrow[loop below, "p"] & S^*(\mathbb{R}^n) \arrow[loop below, "L"] \end{tikzcd}$$

$$\mathrm{Hom}(SX, SY) \sim S(X^*, Y)$$

$$\mathrm{Hom}(\Lambda X, \Lambda Y) \sim \Lambda(X^*, Y)$$

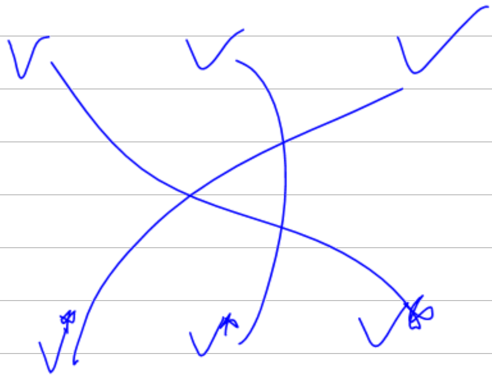
$$\begin{tikzcd} \mathbb{R}\times M_{S\times S}(\mathbb{R}) \arrow[r] \arrow[loop below, "m^{ij}_k"] & \mathrm{Hom}(\Lambda X, \Lambda X) \arrow[d, equal] \\ & \Lambda(X^*, X) \arrow[loop below, "\text{zip w/ } x^n"] \end{tikzcd}$$

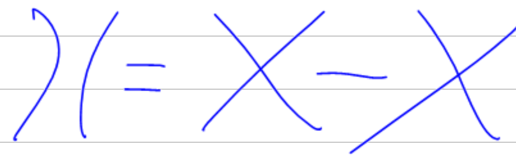
$$(w, A) \longmapsto w\,e^{(x^*)^T A x}$$

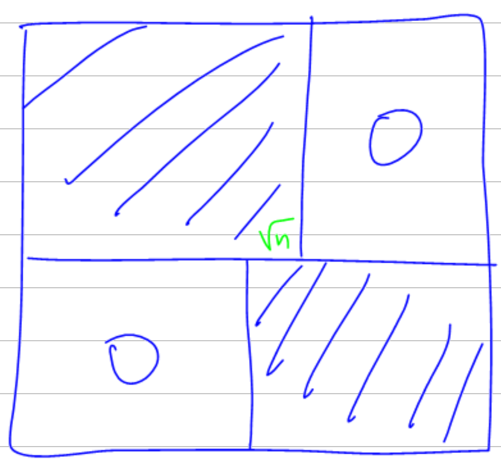


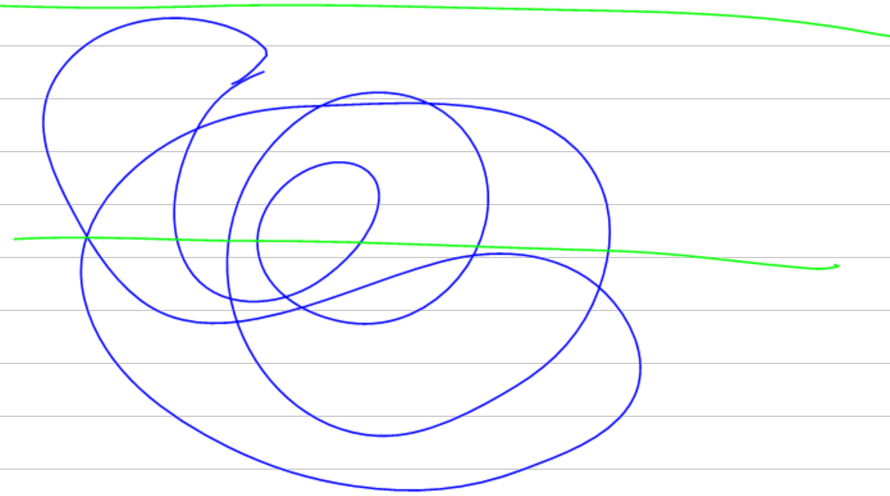
$$\begin{array}{c} A^{\otimes 3} \\ \downarrow \rho \\ V^{\otimes 3} \\ \otimes \\ (V^*)^{\otimes 3} \end{array}$$

$$A \to V^* \otimes V$$

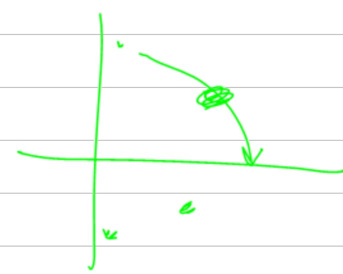




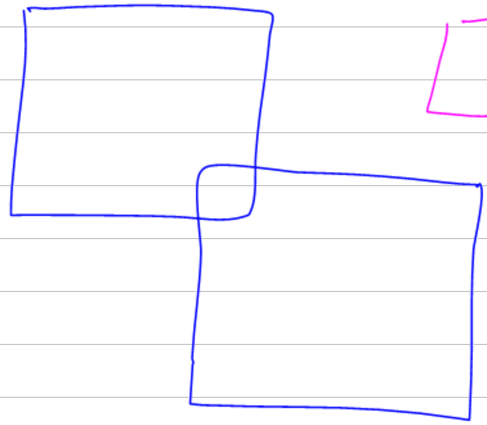


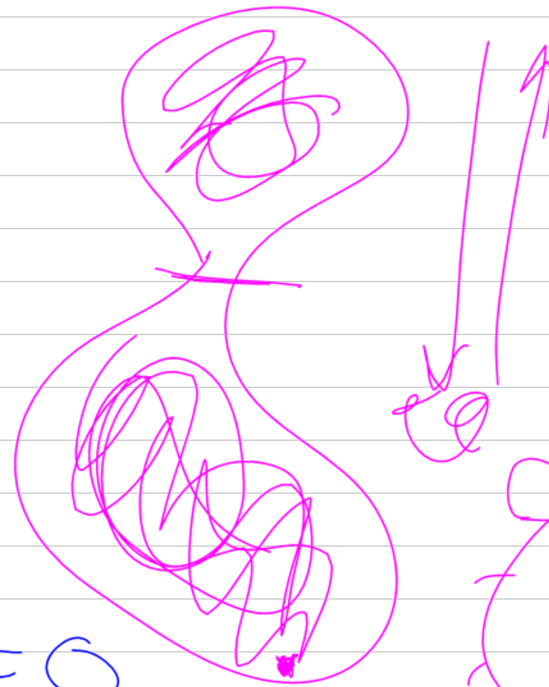


$$\frac{1}{(2\pi)^{n/2}} \int e^{-\frac{1}{2}\lambda_{ij} x^i x^j} = \frac{1}{\sqrt{\det \Lambda}}$$



$$\frac{1}{\sqrt{2\pi}} \int e^{\frac{i\lambda}{2} x^2 - \epsilon x^2} = \frac{1}{\sqrt{i\lambda}} \to \frac{1}{\sqrt{\lambda}} e^{\mp i \frac{\pi}{4} \operatorname{sign} \lambda}$$





$$\underset{\text{even}}{[a}, \underset{\text{odd}}{x}] = x$$

$$\{x, x\} = 0$$

$$x^2 = 0$$

$$Q[a] \otimes \langle 1, x \rangle \qquad \frac{e^5 - 1}{6}$$

$y \; b \; a \; x$

even

odd

$$\{y, x\} = b + ca$$

$$r = ba + yx \qquad R = e^{r}$$

$$U = Q[a, b] \otimes \left\langle \begin{matrix} 1 & x \\ y & yx \end{matrix} \right\rangle$$