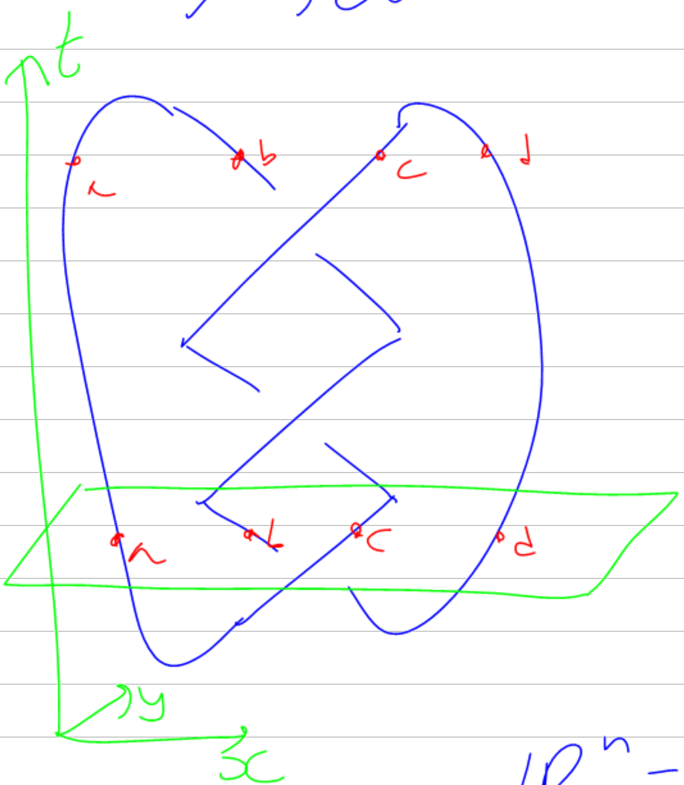
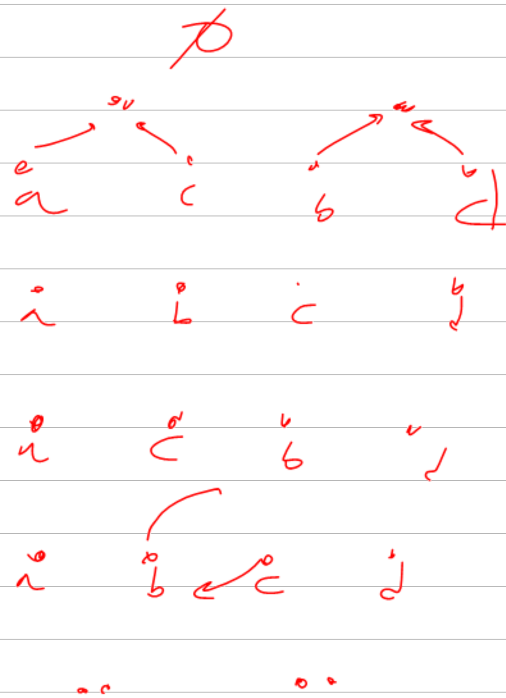
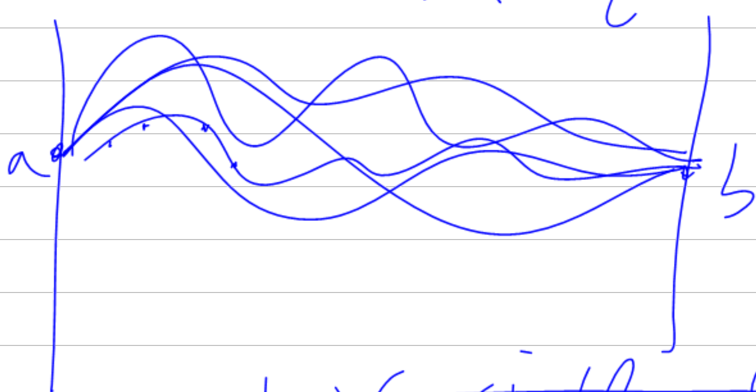
$$\lim_{z\to\infty} e^{-z} = 0$$





$$\mathbb{R}^n = \{(a_1 \ldots a_n)\} \quad \emptyset$$



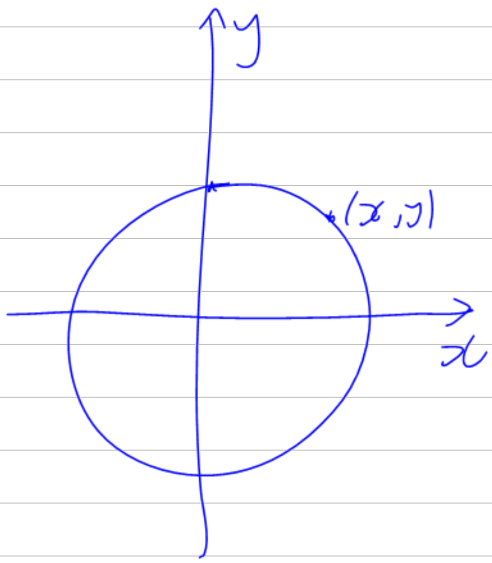
~~1-variable~~ $\int$

~~n-variable~~ $\int$

$\boxed{\infty\text{-dim} \int}$

$$\int e^{ik\int_{\mathbb{R}^3} A\wedge dA + \frac{2}{3}A\wedge A\wedge A}\ \mathrm{hol}_\gamma(A)\ \mathcal{D}A$$

Khovanov homology

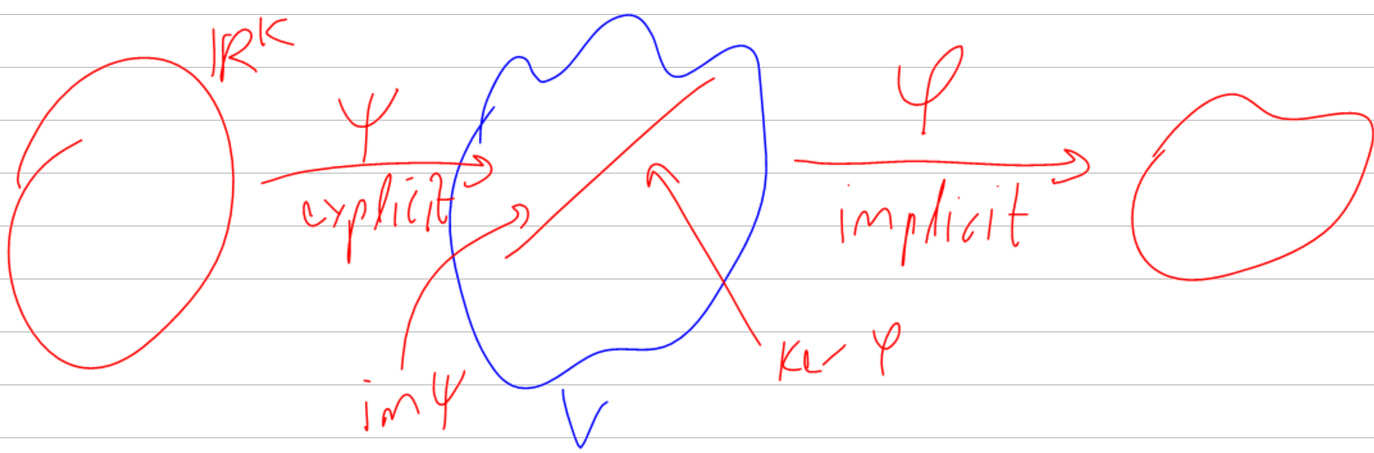


implicit: $x^2+y^2-1=0$

explicit:

$x=\cos\theta$

$y=\sin\theta$



$\mathrm{im}\,\psi \subset \ker\varphi$ $\equiv$ "exact"

$\dfrac{\ker\varphi}{\mathrm{im}\,\psi}$ = homology = measures how good are your constructions

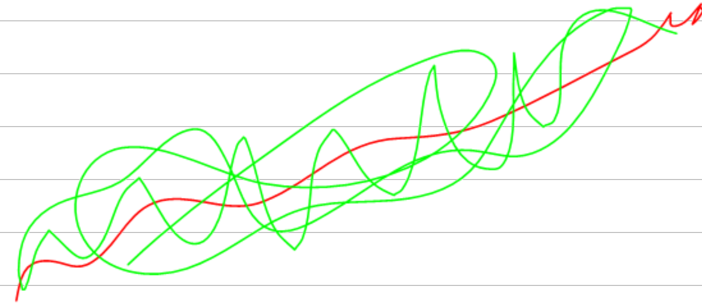
motivation . .

Let F be a Field. A set V is called a V.S if

1:

⋮

15. $\alpha(\beta v) = \ldots$



$$\begin{pmatrix}\text{knots} \\ \text{1-dim things} \\ \text{in } \mathbb{R}^3\end{pmatrix} \sim \begin{pmatrix}\text{0-dim things} \\ \text{dancing in} \\ \mathbb{R}^2\end{pmatrix}$$

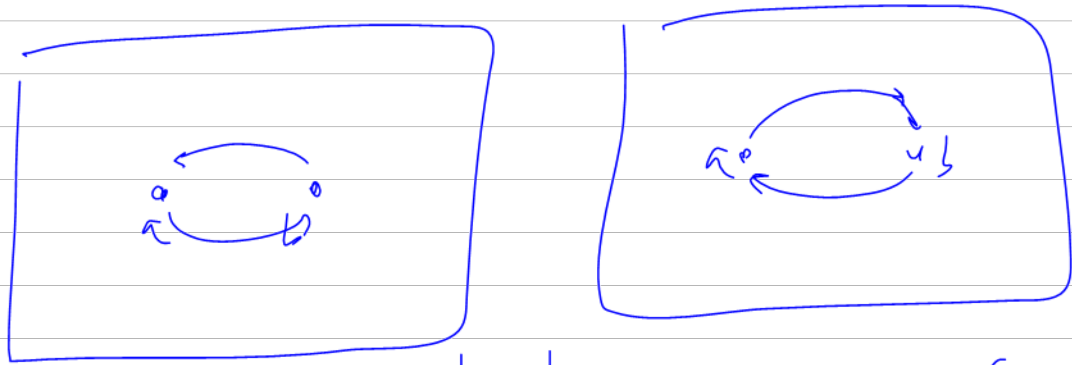
$$\downarrow$$

$$\begin{pmatrix}\text{2-dim thing} \\ \text{knotted} \\ \text{in } \mathbb{R}^4\end{pmatrix} \sim \begin{pmatrix}\text{1-dim things} \\ \text{dancing in } \mathbb{R}^3\end{pmatrix}$$

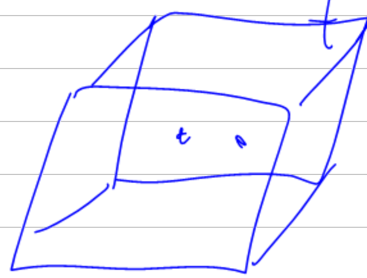
$$\mathbb{R} \xrightarrow{\text{add } i} \mathbb{C} \xrightarrow{\text{add } j,k} \mathbb{H} \xrightarrow{\text{add } h} \mathbb{O}$$

$$1 \qquad 2 \qquad 4 \qquad 8$$

$$\not\to 16$$



two distinct ways of trading places



all ways of trading places are equivalent

$SU(n)$ $SO(n)$ $Sp(n)$ G_2 F_4
E_6 E_7 E_8

$SU(2) \sim SU(3)$

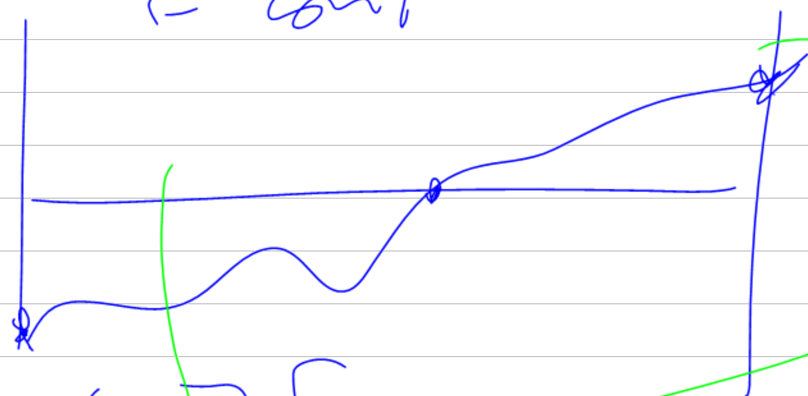
$10^6 \sim 10^{12} \sim 10^{15}$ 10^{100}

∞

$\left(\text{Free markets}\right)^*$ prisoner's dilemma

"The hardest mathematics I've ever really used"

f cont



$$e^x = \sum \frac{x^n}{n!}$$

$\forall \epsilon \; \exists \delta$. _ _ _ _ .