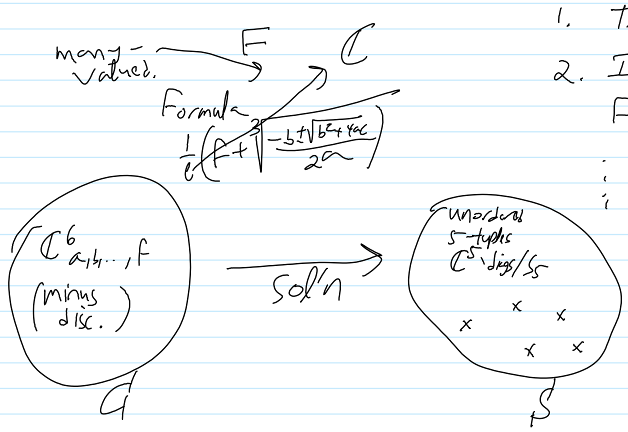
# Friday-9 AKT on 140314: Insolubility of the quintic, our QFT

March-03-14 8:55 PM

## Board 1.

1. Happy $\pi/2$ day! 2. $\sqrt{2}\notin\mathbb{Q}$ 3. $\sqrt[n]{2}\notin\mathbb{Q}$, $n\geq 3$ 4. No formula using $\pm, \times, \div, \sqrt[n]{\ }$ for soln of $ax^5+bx^4+cx^3+dx^2+ex+f=0$, following Arnold & Boaz Katz, youtu.be/RhpVSV6iCko } on board 1

$\boxed{\frac{p}{q}=\sqrt{2}\Rightarrow\frac{2q-p}{p-q}=\sqrt{2}}$ $\boxed{\ldots\text{ contradicting FLT!}}$




1. $\pi_1(S)\longrightarrow S_5$ onto?
2. If $\gamma\subset G$ induces $(123)$, For $\gamma$ starting at $r_1$ also ends w/ $r_1$ $\Rightarrow\Leftarrow$.

⋮

**Def** $CS(A)=\int_M tr(A\wedge dA+\frac{2}{3}A\wedge A\wedge A)$ for 3-D $M$; $CS(A^g)=CS(A)$ } on board 2

$$hol_\gamma(A)(t) = I-\int_0^t ds_1\, A(\dot\gamma(s_1))+\int_{0\leq s_1\leq s_2\leq t} A(\dot\gamma(s_2))A(\dot\gamma(s_1))-\ldots$$

**Claim** $hol_\gamma(A^g)=g(\gamma(t))^{-1}\,hol_\gamma(A)\,g(\gamma(0))$

**Corollary** If $\gamma$ is closed, $tr(hol_\gamma(A))$ is gauge invariant.

---

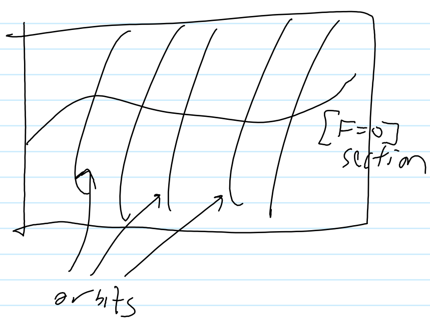
**Def** $Z_{CS}(\gamma)=\frac{1}{Z}\int e^{\frac{ik}{4\pi}CS(A)}\,hol_\gamma(A)\,\mathcal{D}A$

A word about what the perturbation theory of That should look like.

done here

---

Faddeev-Popov:




$\int L\,dx=$ (for invariant $L$)

$$\int L\,\delta(F(x))\det\left(\frac{\partial F^a}{\partial g_b}\right)dx$$

$$=\int L\,e^{iyF(x)}\det\left(\frac{\partial F^a}{\partial g_b}\right)dx\,dy$$