I. *Jones Polynomial; Witten's Path-integral Formulation*

$$V_K(t) = (t + t^3 - t^4)(t^{\frac{1}{2}} + t^{-\frac{1}{2}})$$

$$V_K(e^{\frac{2\pi i}{k+2}}) = -\frac{1}{Z}\int_{\mathcal{A}} \mathrm{Tr}\left(P \exp \oint_K A\right) e^{\frac{ik}{4\pi}CS(A)}\, \mathcal{D}A$$

II. *Commutation relation*

$$C_{ijk}\eta^{kl}C_{lmn} = C_{mjk}\eta^{kl}C_{lin}$$

III. *Braid Relation*

$$R_{12}R_{23}R_{12} = R_{23}R_{12}R_{23}$$

IV. *Equations for Lorenz attractor:*

$$\frac{dx}{dt} = \sigma(y - x)$$

$$\frac{dy}{dt} = x(\rho - z) - y$$

$$\frac{dz}{dt} = xy - \beta z$$

V. *Black hole radius*

$$r_S = 2Gm/c^2$$

VI. *Platonic Solids*

VII. *Golden mean = partial fraction expansion:*

$$\lim_{n\to\infty} \frac{F_{n+1}}{F_n} = 1 + \frac{1}{1 + \ldots}$$

VIII. *Babylonian calculation of* $\sqrt{2}$

$$1; 24; 51; 10 = 1.414213$$

IX. *Pythagorean Theorem*

$$c^2 = a^2 + b^2$$

X. *Archimedes' calculation of volume, area of sphere*

$$v = \frac{2}{3}V$$

$$a = \frac{2}{3}A$$

XI. *Euler characteristic, Gauss-Bonnet Theorem*

$$2\pi\chi = \int_M K \; dA$$

XII. *Aharonov-Bohm Effect*

$$\int_{C_1} \mathbf{A} \cdot \mathbf{d}\ell - \int_{C_2} \mathbf{A} \cdot \mathbf{d}\ell = \Phi$$

XIII. *Supergravity potential*

$$\mathcal{L} = R - \bar{\psi}_\mu \gamma^{\mu\rho\sigma} D_\rho \psi_\sigma$$

XIV. *Navier-Stokes Equation for Fluid Flow*

$$\rho(\partial_t v_i + v_j \partial_j v_i)$$

$$= -\partial_i p + \mu \partial_j \partial_j v_i$$