

1. *Primes and the zeta function:*

$$\prod_p \frac{1}{1 - \frac{1}{p^s}} = \sum_{n=1}^{\infty} \frac{1}{n^s}$$

3. *Yang-Baxter Equation*

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

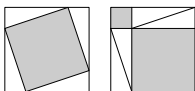


7. *Newton's Law of Gravitation:*

$$F = \frac{Gm_1m_2}{r^2}$$

8. *Pythagoras' Theorem with no-word proof:*

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



10? *Euler's Equation:*

$$e^{i\pi} + 1 = 0$$

11? *Schrödinger's Equation:*

$$i\hbar \frac{\partial \psi}{\partial t} = -\frac{\hbar^2}{2m} \nabla^2 \psi + V\psi$$

12. *Maxwell's Equations in Vacuum:*

$$\begin{aligned}\nabla \cdot \mathbf{B} &= 0 & \nabla \cdot \mathbf{E} &= 0 \\ \nabla \times \mathbf{B} &= \frac{1}{c} \frac{\partial \mathbf{E}}{\partial t} & \nabla \times \mathbf{E} &= -\frac{1}{c} \frac{\partial \mathbf{B}}{\partial t}\end{aligned}$$

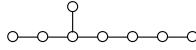
14. *Einstein's General Relativity Equation:*

$$R_{\mu\nu} - \frac{1}{2} R g_{\mu\nu} = 8\pi T_{\mu\nu}$$

16. *Heisenberg Uncertainty Principle:*

$$\Delta x \Delta p \geq \frac{\hbar}{2}$$

17. *Dynkin diagram of  $E_8$ :*



22. *Stokes' Theorem*

$$\int_M d\omega = \int_{\partial M} \omega$$

24. *Atiyah-Singer Theorem for Twisted Dirac Operator:*

$$\dim \ker \mathcal{D}_E - \dim \text{coker } \mathcal{D}_E = \int_{M^{4k}} \hat{A}(M) \cdot \text{ch}(E)$$

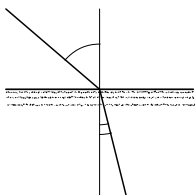
26. *Classical Gauss-Bonnet Theorem:*

$$\chi(M^2) = \frac{1}{2\pi} \int_M K dA$$

27. *Chern-Simons Action:*

$$S_{CS} = \frac{k}{2\pi} \int_M \text{Tr} \left( \frac{1}{2} A \wedge dA + \frac{1}{3} A \wedge A \wedge A \right)$$

29. *Snell's (Pascal's) Law:*



$$\sin i = n \sin r$$

32. *Virasoro algebra:*

$$[L_m, L_n] = (m - n)L_{m+n} + \frac{c}{12}(m^3 - m)\delta_{m+n}$$

34. *Yang-Mills equations:*

$$F = dA + A \wedge A$$

$$\nabla \wedge \star F = 0$$

37. *Dirac Equation:*

$$\begin{aligned} (-i\hbar\gamma^\mu\nabla_\mu + mc)\psi &= 0 \\ \gamma^\mu\gamma^\nu + \gamma^\nu\gamma^\mu &= 2g^{\mu\nu} \end{aligned}$$

39. *Cauchy's Integral Formula:*

$$f(z) = \frac{1}{2\pi i} \oint_C \frac{f(\zeta)}{\zeta - z} d\zeta$$

42? *Navier-Stokes equation:*

$$\partial_t v_i + v_j \partial_j v_i = -\partial_i p + \nu \partial_j \partial_j v_i$$

43. *Kolmogorov Law:*

$$E(k) \sim \varepsilon^{2/3} k^{-5/3}$$

47. *The entropy formula:*

$$S = - \sum_i p_i \log p_i$$

49. *Bott Periodicity:*

$$\pi_i(\mathbb{U}) = \pi_{i+1}(\mathbb{U})$$

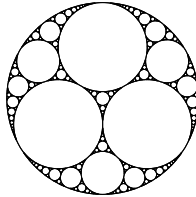
$$\pi_i(\mathbb{O}) = \pi_{i+8}(\mathbb{O})$$

$$\mathbb{Z}_2, \mathbb{Z}_2, 0, \mathbb{Z}, 0, 0, 0, \mathbb{Z}$$

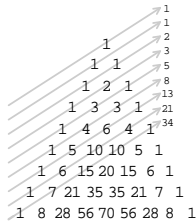
50. *Ricci flow:*

$$\frac{dg_t}{dt} = -2Ric(g_t)$$

51. *Apollonian fractal:*



53? *Pascal's triangle, Fibonacci numbers:*

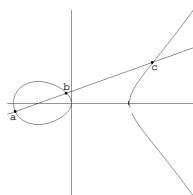


55. *Aharonov-Bohm Effect:*

$$\int_{C_2} \vec{A} \cdot d\vec{\ell} - \int_{C_1} \vec{A} \cdot d\vec{\ell} = \frac{1}{2\pi} \Phi$$

[insert figure]

56. *Group law on cubic:*

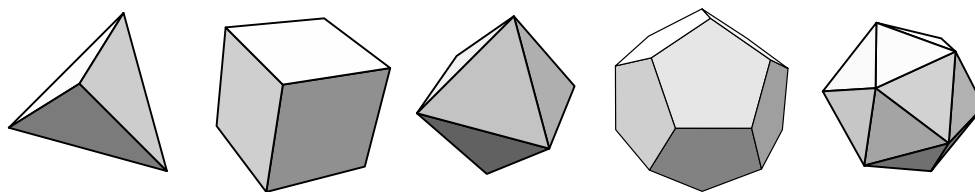


$$a + b + c = 0$$

57? *Riemann-Roch-Hirzebruch:*

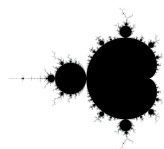
$$\sum_{k=0}^n (-1)^k \dim H^k(X, E) = \int_X ch E \cup Todd(X)$$

58. *Platonic solids, Euler characteristic:*

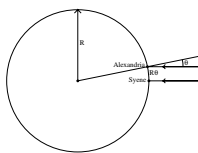


$$V - E + F = 2$$

61? *Mandelbrot Set:*



63. *Eratosthenes' measurement of radius of Earth:*



64? *Prime number Theorem:*

$$\pi(n) \sim \frac{n}{\ln(n)}$$

65. *Supergravity:*

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

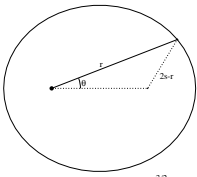
66. *Fourier transform:*

$$\hat{f}(\xi) = \int f(x) e^{2\pi i x \cdot \xi} dx \qquad f(x) = \int \hat{f}(\xi) e^{-2\pi i x \cdot \xi} d\xi$$

67. *Euler's summation for  $\zeta(2)$ :*

$$1 + \frac{1}{4} + \frac{1}{9} + \dots = \frac{\pi^2}{6}$$

68. *Kepler's laws:*



$$r \, d\theta \, h = \text{constant}, \quad \dot{\phi} \, dt = \omega^{3/2}$$