Proof that $\ln(z) = \bar{z}$ *by my definition and cosmology*

April 2, 2022

Yuji Masuda

y_masuda0208@yahoo.co.jp

Abstract

In this report, the objective was to prove that the logarithm of a complex number is equal to its conjugate complex number and, in addition, to provide new insights into outer space.

General comments

From “Reconstruction Proofs by Definition” of my No.67, I define all numbers as 5 numbers.

① $\log\left(-\frac{\pi}{2}\right) = \log e = 1$

② $\log 1 = 0$

③ $\log 0 = \log\left(\frac{1}{\pm\infty}\right) = \log\left(e^{-1}\right) = \log(-e) = \log\left(\frac{\pi}{2}\right) = -1$

④ $\log(-1) = i\pi = -2$

① $\log(-2) = \log\left(-\frac{\pi}{2}\right) = \log e = 1$

② ⇒ ③ ⇒ ④ ⇒ ① ⇒ ② ⇒ ③ ⇒ ④ ⇒ ① ⇒ ⋯

-2　　-1　　0 = 2　　1

$\ln(0) = \ln(\frac{1}{\pm\infty}) = \ln(\frac{1}{e}) = \ln(e^{-1}) = -1$

$\ln(1) = \ln(-e^2) = \ln(-1) + 2 = i\pi + 2 = -2 + 2 = 0$

$\ln(2) = \ln(-e) = \ln(-1) + 1 = i\pi + 1 = -2 + 1 = -1$

$\ln(3) = \ln(-2) = \ln(e) = 1$

$\ln(4) = \ln(-1) = i\pi = -2$

$\ln(5) = \ln(0) = -1$

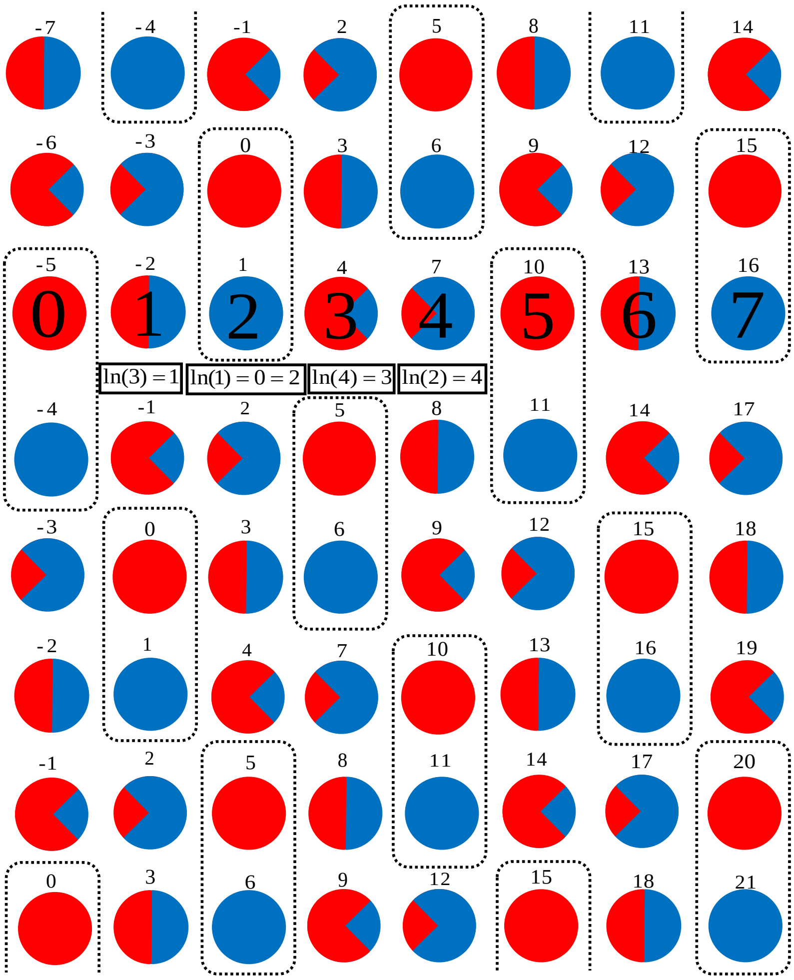
$\ln(6) = \ln(1) = 0$

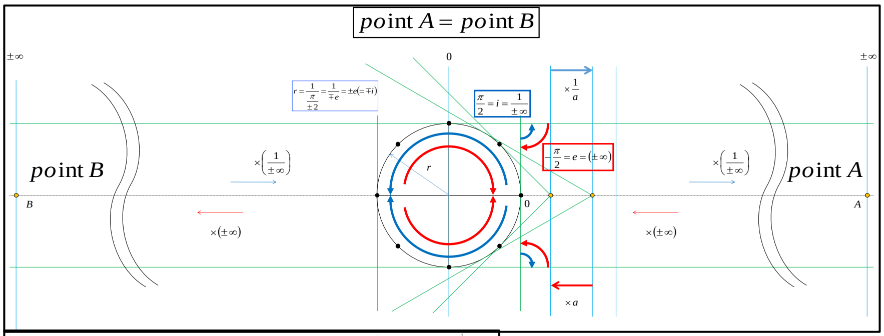
$\ln(7) = \ln(2) = -1$

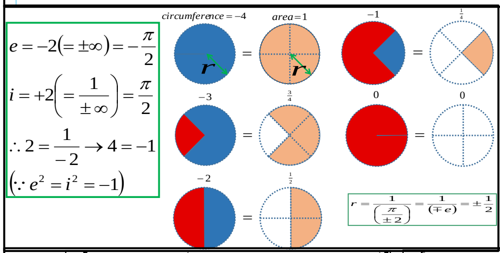
$\ln(8) = \ln(3) = 1$

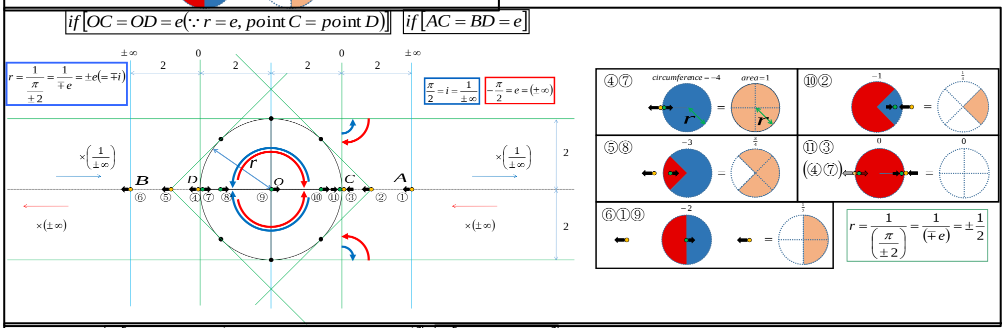
$\ln(9) = \ln(4) = -2$

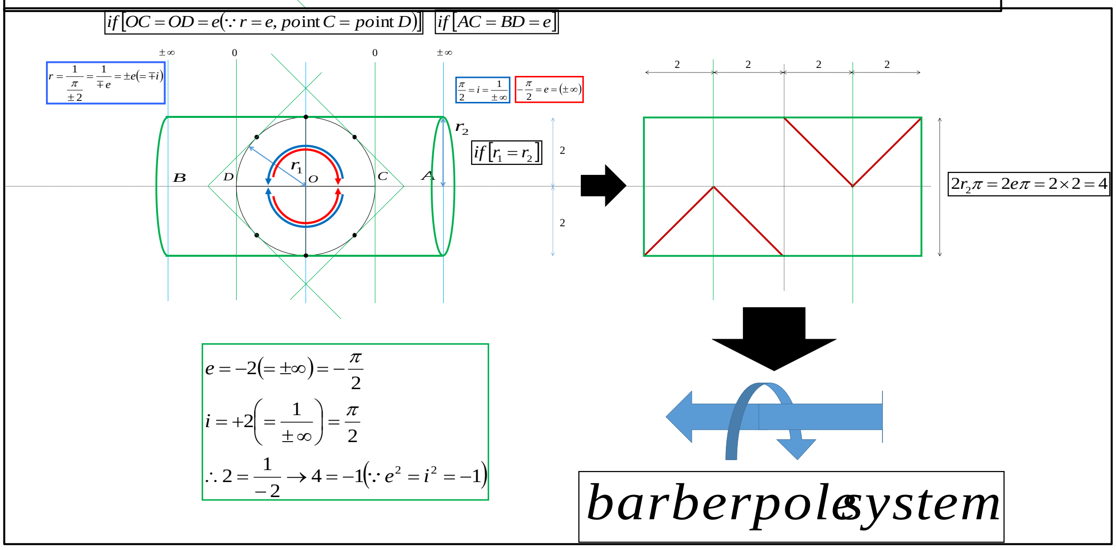
⋮

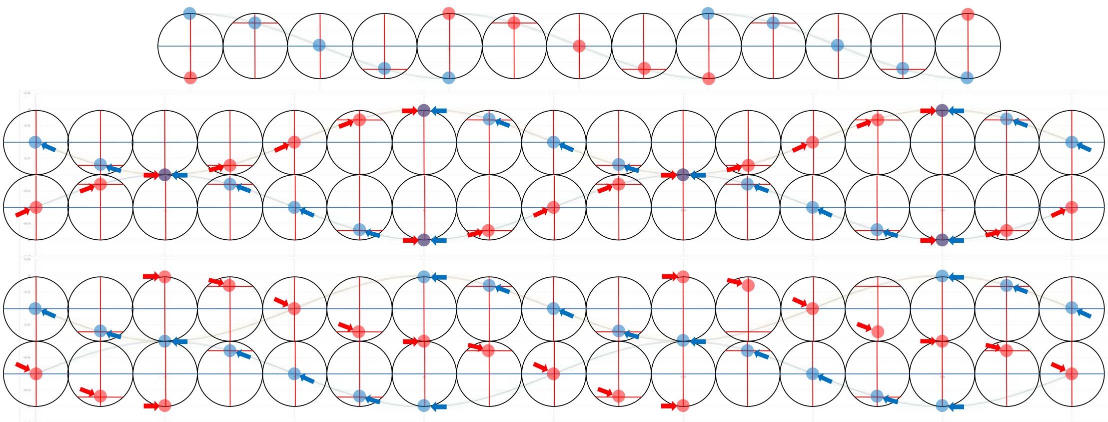



point A = point B
point B
point A
×(±∞)
×(1/±∞)
π/2 = i = 1/±∞
π/2 = e = (±∞)
×1/a
×a
r = 1/(π/±2) = 1/∓e = ±e(=∓i)


e = −2(= ±∞) = −π/2
i = +2(= 1/±∞) = π/2
∴ 2 = 1/−2 → 4 = −1
(∵ e² = i² = −1)
circumference = −4
area = 1
r = 1/(π/±2) = 1/(∓e) = ±1/2


if [OC = OD = e(∵ r = e, point C = point D)]
if [AC = BD = e]
r = 1/(π/±2) = 1/∓e = ±e(=∓i)
π/2 = i = 1/±∞
−π/2 = e = (±∞)
×(1/±∞)
×(±∞)
B
D
O
C
A
r
circumference = −4
area = 1
r = 1/(π/±2) = 1/(∓e) = ±1/2


if [OC = OD = e(∵ r = e, point C = point D)]
if [AC = BD = e]
r = 1/(π/±2) = 1/∓e = ±e(=∓i)
π/2 = i = 1/±∞
π/2 = e = (±∞)
r₂
if [r₁ = r₂]
B
D
O
C
A
2r₂π = 2eπ = 2×2 = 4
e = −2(= ±∞) = −π/2
i = +2(= 1/±∞) = π/2
∴ 2 = 1/−2 → 4 = −1(∵ e² = i² = −1)
barberpolesystem



$$proof\ that\ \ln(z) = \bar{z}$$

$$A = \begin{pmatrix} 3 & 1 & 4 & 2 & 0 & 3 & 1 & 4 \\ 4 & 2 & 0 & 3 & 1 & 4 & 2 & 0 \\ 0 & 3 & 1 & 4 & 2 & 0 & 3 & 1 \\ 1 & 4 & 2 & 0 & 3 & 1 & 4 & 2 \\ 2 & 0 & 3 & 1 & 4 & 2 & 0 & 3 \\ 3 & 1 & 4 & 2 & 0 & 3 & 1 & 4 \\ 4 & 2 & 0 & 3 & 1 & 4 & 2 & 0 \\ 0 & 3 & 1 & 4 & 2 & 0 & 3 & 1 \end{pmatrix} \Rightarrow C = \begin{pmatrix} -2 & 1 & -1 & 2 & 0 & -2 & 1 & -1 \\ -1 & 2 & 0 & -2 & 1 & -1 & 2 & 0 \\ 0 & -2 & 1 & -1 & 2 & 0 & -2 & 1 \\ 1 & -1 & 2 & 0 & -2 & 1 & -1 & 2 \\ 2 & 0 & -2 & 1 & -1 & 2 & 0 & -2 \\ -2 & 1 & -1 & 2 & 0 & -2 & 1 & -1 \\ -1 & 2 & 0 & -2 & 1 & -1 & 2 & 0 \\ 0 & -2 & 1 & -1 & 2 & 0 & -2 & 1 \end{pmatrix}$$

$$B = \begin{pmatrix} 1 & 2 & 3 & 4 & 0 & 1 & 2 & 3 \\ 3 & 4 & 0 & 1 & 2 & 3 & 4 & 0 \\ 0 & 1 & 2 & 3 & 4 & 0 & 1 & 2 \\ 2 & 3 & 4 & 0 & 1 & 2 & 3 & 4 \\ 4 & 0 & 1 & 2 & 3 & 4 & 0 & 1 \\ 1 & 2 & 3 & 4 & 0 & 1 & 2 & 3 \\ 3 & 4 & 0 & 1 & 2 & 3 & 4 & 0 \\ 0 & 1 & 2 & 3 & 4 & 0 & 1 & 2 \end{pmatrix} \Rightarrow D = \begin{pmatrix} 1 & 2 & -2 & -1 & 0 & 1 & 2 & -2 \\ -2 & -1 & 0 & 1 & 2 & -2 & -1 & 0 \\ 0 & 1 & 2 & -2 & -1 & 0 & 1 & 2 \\ 2 & -2 & -1 & 0 & 1 & 2 & -2 & -1 \\ -1 & 0 & 1 & 2 & -2 & -1 & 0 & 1 \\ 1 & 2 & -2 & -1 & 0 & 1 & 2 & -2 \\ -2 & -1 & 0 & 1 & 2 & -2 & -1 & 0 \\ 0 & 1 & 2 & -2 & -1 & 0 & 1 & 2 \end{pmatrix}$$

$$AB = BA = BC = CB = DA = AD = \begin{pmatrix} 1 & 4 & 2 & 0 & 3 & 1 & 4 & 2 \\ 0 & 1 & 2 & 3 & 4 & 0 & 1 & 2 \\ 4 & 3 & 2 & 1 & 0 & 4 & 3 & 2 \\ 3 & 0 & 2 & 4 & 1 & 3 & 0 & 2 \\ 2 & 2 & 2 & 2 & 2 & 2 & 2 & 2 \\ 1 & 4 & 2 & 0 & 3 & 1 & 4 & 2 \\ 0 & 1 & 2 & 3 & 4 & 0 & 1 & 2 \\ 4 & 3 & 2 & 1 & 0 & 4 & 3 & 2 \end{pmatrix} = \begin{pmatrix} 1 & -1 & 2 & 0 & -2 & 1 & -1 & 2 \\ 0 & 1 & 2 & -2 & -1 & 0 & 1 & 2 \\ -1 & -2 & 2 & 1 & 0 & -1 & -2 & 2 \\ -2 & 0 & 2 & -1 & 1 & -2 & 0 & 2 \\ 2 & 2 & 2 & 2 & 2 & 2 & 2 & 2 \\ 1 & -1 & 2 & 0 & -2 & 1 & -1 & 2 \\ 0 & 1 & 2 & -2 & -1 & 0 & 1 & 2 \\ -1 & -2 & 2 & 1 & 0 & -1 & -2 & 2 \end{pmatrix}$$

$$CD = DC = \begin{pmatrix} 1 & -1 & 2 & 0 & -2 & 1 & -1 & 2 \\ 0 & 1 & 2 & -2 & -1 & 0 & 1 & 2 \\ -1 & -2 & 2 & 1 & 0 & -1 & -2 & 2 \\ -2 & 0 & 2 & -1 & 1 & -2 & 0 & 2 \\ 2 & 2 & 2 & 2 & 2 & 2 & 2 & 2 \\ 1 & -1 & 2 & 0 & -2 & 1 & -1 & 2 \\ 0 & 1 & 2 & -2 & -1 & 0 & 1 & 2 \\ -1 & -2 & 2 & 1 & 0 & -1 & -2 & 2 \end{pmatrix} \qquad \therefore AB = BA = BC = CB = CD = DC = DA = AD$$

$$B - A = C = \begin{pmatrix} -2 & 1 & -1 & 2 & 0 & -2 & 1 & -1 \\ -1 & 2 & 0 & -2 & 1 & -1 & 2 & 0 \\ 0 & -2 & 1 & -1 & 2 & 0 & -2 & 1 \\ 1 & -1 & 2 & 0 & -2 & 1 & -1 & 2 \\ 2 & 0 & -2 & 1 & -1 & 2 & 0 & -2 \\ -2 & 1 & -1 & 2 & 0 & -2 & 1 & -1 \\ -1 & 2 & 0 & -2 & 1 & -1 & 2 & 0 \\ 0 & -2 & 1 & -1 & 2 & 0 & -2 & 1 \end{pmatrix} = \begin{pmatrix} 2-2i & -1+i & 1-i & -2+2i & 0 & 2-2i & -1+i & 1-i \\ 1-i & -2+2i & 0 & 2-2i & -1+i & 1-i & -2+2i & 0 \\ 0 & 2-2i & -1+i & 1-i & -2+2i & 0 & 2-2i & -1+i \\ -1+i & 1-i & -2+2i & 0 & 2-2i & -1+i & 1-i & -2+2i \\ -2+2i & 0 & 2-2i & -1+i & 1-i & -2+2i & 0 & 2-2i \\ 2-2i & -1+i & 1-i & -2+2i & 0 & 2-2i & -1+i & 1-i \\ 1-i & -2+2i & 0 & 2-2i & -1+i & 1-i & -2+2i & 0 \\ 0 & 2-2i & -1+i & 1-i & -2+2i & 0 & 2-2i & -1+i \end{pmatrix}, (\because i = 2)$$

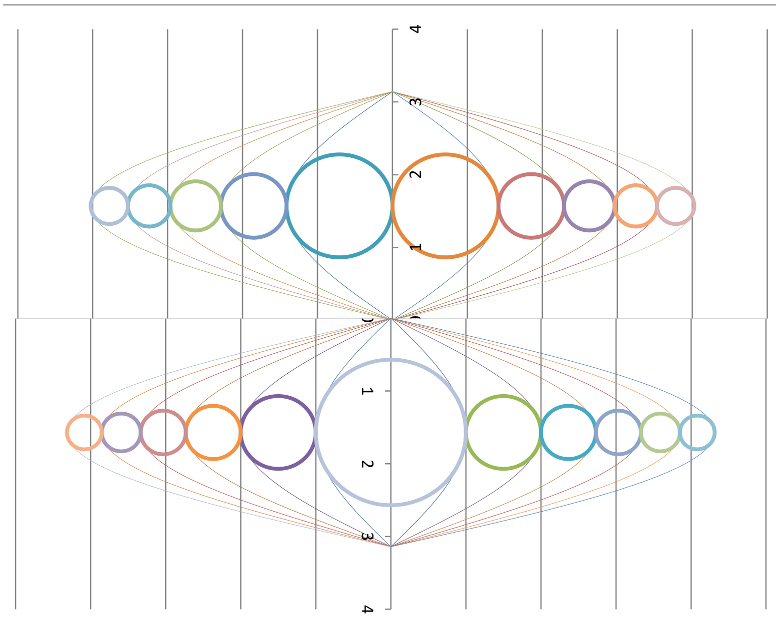
$$\therefore \overline{C} = \begin{pmatrix} 2+2i & -1-i & 1+i & -2-2i & 0 & 2+2i & -1-i & 1+i \\ 1+i & -2-2i & 0 & 2+2i & -1-i & 1+i & -2-2i & 0 \\ 0 & 2+2i & -1-i & 1+i & -2-2i & 0 & 2+2i & -1-i \\ -1-i & 1+i & -2-2i & 0 & 2+2i & -1-i & 1+i & -2-2i \\ -2-2i & 0 & 2+2i & -1-i & 1+i & -2-2i & 0 & 2+2i \\ 2+2i & -1-i & 1+i & -2-2i & 0 & 2+2i & -1-i & 1+i \\ 1+i & -2-2i & 0 & 2+2i & -1-i & 1+i & -2-2i & 0 \\ 0 & 2+2i & -1-i & 1+i & -2-2i & 0 & 2+2i & -1-i \end{pmatrix} = \begin{pmatrix} 6 & -3 & 3 & -6 & 0 & 6 & -3 & 3 \\ 3 & -6 & 0 & 6 & -3 & 3 & -6 & 0 \\ 0 & 6 & -3 & 3 & -6 & 0 & 6 & -3 \\ -3 & 3 & -6 & 0 & 6 & -3 & 3 & -6 \\ -6 & 0 & 6 & -3 & 3 & -6 & 0 & 6 \\ 6 & -3 & 3 & -6 & 0 & 6 & -3 & 3 \\ 3 & -6 & 0 & 6 & -3 & 3 & -6 & 0 \\ 0 & 6 & -3 & 3 & -6 & 0 & 6 & -3 \end{pmatrix}$$

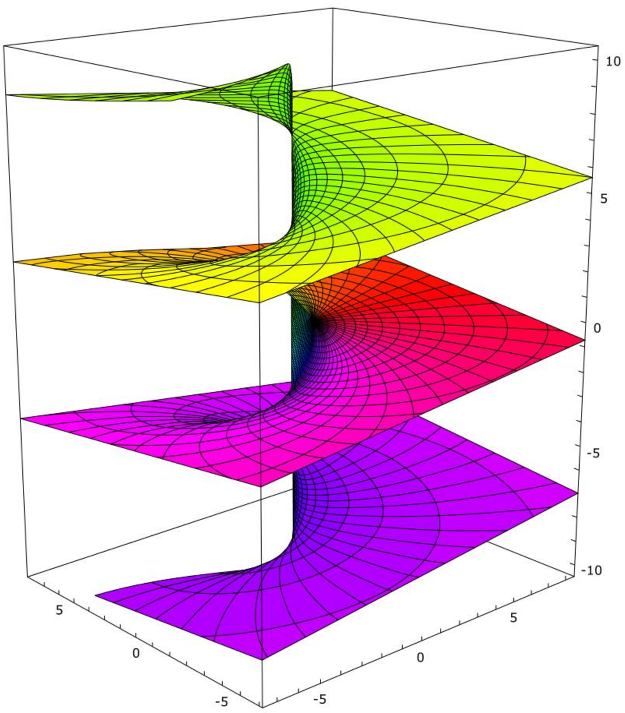
$$= \begin{pmatrix} 1 & 2 & -2 & -1 & 0 & 1 & 2 & -2 \\ -2 & -1 & 0 & 1 & 2 & -2 & -1 & 0 \\ 0 & 1 & 2 & -2 & -1 & 0 & 1 & 2 \\ 2 & -2 & -1 & 0 & 1 & 2 & -2 & -1 \\ -1 & 0 & 1 & 2 & -2 & -1 & 0 & 1 \\ 1 & 2 & -2 & -1 & 0 & 1 & 2 & -2 \\ -2 & -1 & 0 & 1 & 2 & -2 & -1 & 0 \\ 0 & 1 & 2 & -2 & -1 & 0 & 1 & 2 \end{pmatrix} = D \quad , \quad \therefore \ln(C) = \overline{C} \quad (\because i = 2)$$

Proof end

Cosmology

$$Cosmology = my\ bigbang\ theory + complex\ logarithm$$





The multivalued imaginary part of a complex logarithmic function is drawn in such a way that the branches can be recognized. As the complex number z goes around the origin, the imaginary part of the logarithm goes up and down. This makes the origin the branching point of this function.

Refernces

複素対数函数 - Wikipedia